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PHARMACOLOGIC SUPERSTITIONS

HORATIO C. WOOD, JR., M.D.

PHILADELPHIA

THE TEST OF UTILITY

There are a number of worthless therapeutic practices — some based on abandoned theories of pathology, some due to technical errors in pharmacologic investigations, some based on misinterpreted clinical observations, and some the mere relics of medieval superstition — which still persist in common use. Some of these receive even today the sanction of authority; men whose acumen in many lines has won our respect occasionally lend the weight of their recommendation to measures which can be defended on neither theoretical grounds nor clinical results. It has seemed to me that it might be worth while to call attention to the source of some of the more common superstitions of this character.

First, however, it is necessary to establish the criteria on which we base our judgment as to the therapeutic value of a drug. Certainly the length of time during which a drug has been employed in medicine furnishes no measure of its usefulness. Ammoniac gum was described by Dioscorides in the first century, and for more than a thousand years was highly esteemed, but has fallen into such disuse that it is no longer recognized by the U. S. Pharmacopeia. In studying the materia medica of the first, tenth and fifteenth centuries, one is struck by their similarity to each other and their difference from that of today. Remedies whose reputation was sustained unabated for 2,000 years have been unable to bear the light of modern knowledge, and within half a century have not only been completely discarded as worthless but their very names forgotten.

The first edition of the U. S. Pharmacopeia was published less than a century ago.[1] Of 624 drugs and preparations deemed by the editors of that work to be "those, the utility of which is most fully established," 305 have been already despoiled of their official recognition. I have been surprised in looking over this interesting work, not so much, however, by the number of ancient remedies which we have ceased to use, but by the absence of drugs today universally recognized as our most valuable weapons against disease. Neither iodin nor any of the iodids are in the first American Pharmacopeia; one looks in vain for potassium bromid or any other preparation of bromin; there is no form of salicylic acid except the oil of gaultheria, and that apparently was recognized only for its aromatic odor; one finds neither chloral nor any of our modern somnifacients; coca and cocain are both missing, as are also santonica and santonin; ether is recognized, but chloroform was unknown; nitroglycerin is not mentioned, the only form of nitrite recognized being sweet spirits of niter; the only mention of ergot is in the secondary list — that is, drugs of doubtful worth — where is listed *Secale cornutum* or spurred rye, but it was not deemed of sufficient importance to have any preparation recognized. One is not surprised at the absence of our modern coal tar derivatives, such as acetanilid and phenol (carbolic acid), but that the usefulness of aspidium or pilocarpus should not have been earlier discovered seems worthy of comment. In the place of these remedies which the present day physician relies on in such a host of conditions, we find horseradish, oatmeal, barley, stag's horn, metallic gold and silver, cowhage — whose sharp bristles were used as a vermifuge on the theory that they would stab the worm to death — and scores of remedies not even whose names would be known to many readers.

Are we to gage the utility of a therapeutic agent by the clinical results we think we see? Wendell Phillips said in one of his famous orations, "You read history not with your eyes but with your prejudices." The thought might well be applied to the medical profession. Practically all our experience is interpreted through the glasses of our prejudice. Never, since the days when the ancient Assyrian chanted his exorcisms of the pathogenic devil according to the phases of the moon, have men been able to free themselves in the choice of their remedies from the dominance of some theory concerning disease. Indeed, it cannot well be otherwise. The manifestations of disease are so protean, and its development subject to such an infinitude of variation, that no simple collection of observations without interpretation is of the slightest value. If those who believe that empiricism should be the only guide in the treatment of the sick could read the history of medicine "with their eyes," they would see what a feeble flickering light to the progress of medical science experience has been; nay, it has been a veritable will-o'-the-wisp, leading men astray farther and farther from the truth. For fifteen centuries the experiences of medical Europe were interpreted to suit the theories of the great Galen, and in these fifteen hundred years, with their observations of millions of deaths, physicians learned absolutely nothing of how to relieve suffering or prolong life. A splendid illustration of the blindness of humanity to their surroundings is seen in the duration of the bloodletting superstition. For three centuries physicians with the best motives bled their patients to death, absolutely incapable of realizing that their venesection killed far

1. Dec. 15, 1820.

more than it saved. Despite the frightful mortality of their methods of treatment, they clung to the error with the enthusiasm of a religious fanatic. Dr. Benjamin Rush on his deathbed, almost pulseless from the combined effects of disease and repeated venesections, begged the attending physicians to bleed him again. The story of the pneumonia "cures" is another interesting confirmation of the deceptiveness of experience. Time after time has some new method of treating this disease been brought forward with most impressive statistics which would seem to have established it as of the utmost value, and yet despite the venesection, veratrum, creosote, quinin, alcohol, camphor, ice jackets and poultices, the mortality of this disease is practically unaffected.

Of the drugs of generally recognized utility,[2] numbering about 270, not one third of those introduced within the last hundred years were discovered through the medium of bedroom observations.

If neither antiquity nor clinical results can establish the therapeutic credentials, on what grounds are we to accept therapeutic claims? There are those who pretend to believe that the final judgment as to the therapeutic value of a drug can be made in the pharmacologic laboratory; such a claim, however, is so foolish as scarcely to be worthy of a refutation. Although it is undeniable that we owe most of our useful drugs to the researches of chemists or physiologists, their conclusions concerning the value of a remedy can be accepted only when confirmed by clinical experience. I do not know how many rabbits Ehrlich and his assistants cured with salvarsan, but I do know that he was unwilling to permit this drug to be placed on the market until the conclusions of his laboratory were clinically tested in the hospital. Ehrlich felt the need of clinical confirmation in the claims for his new remedy, but it is extremely rare that laboratory workers are able to present such direct or definite evidence as to the value of a therapeutic agent.

We reach conclusions of therapeutic usefulness by a circuitous route: the pathologist tells first what he believes is the nature of the morbid disturbance, the pharmacologist explains how the drug seems to modify the bodily functions, the practitioner tries if the observation of the pharmacologist fits to that of the pathologist as one should expect. It is like a puzzle picture: the color and shape of one piece seems to indicate its juxtaposition to another; but only when they are actually fitted into each other can we be sure that they really do belong together. To change the simile, we build up a system of treatment on the foundation of pathologic hypothesis, using stones of pharmacologic experiments cemented together by deductive reasoning. The clinical imperfections of the structure may or may not be manifest at once. Only after the building has withstood many storms can we be sure of its stability. The weaknesses which develop may be due to the faults in the pathologic or pharmacologic building material, but above all to the weakness of our dialectic binding together.

Perhaps I can make my meaning clearer by concrete examples. The effects of certain drugs in relieving symptoms are so obvious that even the most casual observer can convince himself of their action. Antimony will produce emesis, or pilocarpin increase the secretion of sweat with such infallibility that even the prejudiced observer could not fail to connect cause and effect; but the question of whether the emetic action of antimony is beneficial in pneumonia, as the ancients believed, or whether the diaphoresis produced by pilocarpin is useful in uremia, as we believe, requires nicer discrimination and cannot be answered dogmatically. The commonly accepted theory of uremia is that the symptoms are caused by the retention of some poison in the system, and that by the use of eliminants we bring about the excretion of this poison through other channels. After all, however, it cannot be considered as proved that uremia is due to the retention of a poison, and our theories that purgation and sweating are capable of carrying off this poison are certainly not positively established. But because of our belief in the pathogenesis of this condition, and our faith in the effect of eliminating measures, we persuade ourselves that we see beneficial effects from the treatment.

It seems to me fair to conclude that we are justified in giving credence to claims of therapeutic usefulness when the known action of the drug permits of a plausible explanation of its asserted benefits, not inharmonious with the accepted theories of the disease and supported by a fair amount of bedside corroboration.

In the absence of a reasonable hypothesis as to the mode of action, a gigantic accumulation of clinical evidence may establish the utility of any therapeutic measure; but when a candidate for therapeutic recognition can present no scientific logic, or only one which is demonstrably erroneous, and its clinical credentials are both vague and scanty, we are certainly justified in regarding its claims with suspicion.

It is my purpose to judge some traditional remedies by the standard set forth; if there is neither reason nor result to appear in defense of a drug, no matter how ancient its lineage may be, I opine it should be relegated to the limbo of all forgotten superstitions.

COMPOUND SYRUP OF HYPOPHOSPHITES

This preparation, which is so widely employed as a tonic, especially in tuberculous conditions, contains, beside the hypophosphites of calcium, magnesium, potassium and sodium, small quantities of iron, of quinin and of strychnin. The amount of iron in 2 fluidrams of the syrup, which is the pharmacopeial dose, is equivalent to approximately $\frac{1}{20}$ grain, of quinin $\frac{1}{8}$ grain, and of strychnin $\frac{1}{75}$ grain. It is manifest that neither the iron nor the quinin can have any effect on the body, and that the strychnin can have only an infinitestimal hypothetic action. As for the hypophosphites themselves, they owe their introduction into medicine to a Dr. Churchill.[3] His theory was that phthisis was due to diminished oxidation in the tissues; phosphorus has a strong affinity for oxygen and therefore would attract oxygen into the body, but it is too highly poisonous for remedial use; the hypophosphites, being incompletely oxidized derivatives of phosphorus, would have the same affinity for oxygen, and being only slightly poisonous, could be given in larger dose. As regards this theory it may first be pointed out that there is no reason to believe that there is diminished oxidation in phthisis; in fact it would seem that it is usually increased; secondly, the hypophosphites pass through the body unchanged, that is, they do not attract oxygen in sufficient quantity to oxidize themselves.

Supposing, however, that Churchill's theory of the cause of tuberculosis were true, it would in no way

2. A Handbook of Useful Drugs, Chicago, 1913.

3. For the history of the hypophosphite fallacy see THE JOURNAL A. M. A., April 25, 1914, p. 1346.

argue in favor of the use of the compound syrup of the hypophosphites as a practical remedy. An ordinary man burns up from 800 to 1,000 gm. of oxygen a day. It requires about 3 per cent. of oxygen to saturate the earthy hypophosphites; compound syrup of hypophosphites contains, in all, approximately 7.5 per cent. of hypophosphites; therefore 2 teaspoonfuls of the compound syrup of hypophosphites has theoretical attractions for 0.018 gm. of oxygen. To cause an increase of 10 per cent. in the daily consumption of oxygen would require a dose of about 4,000 c.c., or 1 quart four times a day. While it is possible that a patient might survive the hypophosphites in this quantity, he would certainly die of strychnin or quinin poisoning.

Dr. Churchill's theory having been shown to be erroneous, it would require, according to the postulates given above, the most positive clinical evidence to establish his conclusion. In the book of over 250 pages announcing his discovery,[4] he reports the results of thirty-five cases, of which nine patients were classed as cured, eleven as improved, and fourteen died! Even allowing for the progress which has been made in recent years in the management of tuberculosis, this record seems hardly favorable enough to justify his conclusions as to the specificity of the treatment. As for other clinical evidence, it is equally unconvincing. There has been a relatively small number of papers in medical literature on this subject, and most of those which have appeared are made up almost entirely of such vague generalities as "the treatment has given me good satisfaction." In a brochure published in 1881 by McArthur — who, being commercially interested in this therapeutic measure, is not likely to have overlooked any reports favorable to it — the statement is made that the favorable conclusions are based on 259 cases, certainly not an overwhelming mass of evidence after twenty-three years of clinical trial!

Churchill recommended only the hypophosphite of lime, but Dr. McArthur modified this by adding also the hypophosphites of potassium and sodium and dispensing in the form of syrup. It is interesting to note that the real out and out hypophosphitists maintain that neither strychnin nor iron should ever be combined with the hypophosphites. Nevertheless an English pharmacist by the name of James I. Fellows, about 1870, put on the market a syrup of composition similar to that which is present in the United States Pharmacopeia. The origin of this compound, according to Fellows' claim, was his own personal experience. He had a chronic bronchitis which by some of his medical friends was pronounced tuberculous, although there seems to have been great difference of opinion among the various physicians who examined him as to the nature of his malady. He began to experiment on himself with various combinations of drugs which he imagined might be beneficial. After four years of such self-dosing he completely regained his health and attributed the result to the concoction which is now known as Fellows' Compound Syrup of Hypophosphites.

Fellows' explanation of the modus operandi of the remedy is even more remarkable than that of Dr. Churchill. Thus he begins his brochure in 1882 with the words, "This is a combination of salts allied to blood salts, and consequently true hematics, with the blood building iron and the two powerful vegetable tonics strychnine and quinine."[5] Sodium chlorid is just as nearly "allied to the blood salts" as any salt in his syrup, but one would hardly attribute to ordinary salt any specific virtues in tuberculosis.

On page 8 of the same brochure he says: "The hypophosphorus acid *seems*[6] to furnish the phosphorus for the construction of lecithin more readily than the stable form phosphoric acid. Consequently . . . the less stable form of hypophosphites can be broken up for the production of free phosphorus for the production of lecithin." In support of this hypothesis he gives not the slightest scintilla of evidence, but goes on the common principle of nostrum venders that any assertion made with sufficient dogmatism will be accepted by the medical profession. To the contrary, the investigations of Boddaert,[7] of Mossol and Gamel,[8] and of Panzer[9] have shown definitely that the statement is untrue, the hypophosphites passing through the system and being eliminated by the kidneys as any foreign salt.

An unbiased study of the evidence, it seems to me, must inevitably lead to the conclusion that any therapeutic virtue in the compound syrup of hypophosphites is due to the sugar it contains.

Some skeptical empiricist rises up to ask, If this mixture is so impotent why is it so widely employed? The reasons for its popularity are two: First, and most important, the persistent advertising methods of the manufacturers of certain brands of the compound syrup of hypophosphites, and secondly, its innocuous character. It is better to do nothing than to do the wrong thing, and when the patient insists on having some form of medicine and the physician knows of no drug which is likely to be beneficial, he satisfies the longing of the sick man by ordering the compound syrup of hypophosphites, and salves his conscience with the thought that at least he has done no harm.

LITHIA

The use of salts of lithium in the treatment of gout was introduced by Garrod.[10] He based his application of this remedy on the hypotheses that the gouty paroxysm is due to the deposit of urates in the joint, that this deposit is brought about by a diminished alkalinity of the blood which lessens the solubility of the salts of uric acid, and that lithia by a solvent action on the uric acid prevented the deposit. In support of the latter view he quotes the experiments of Binswanger, who found that one part of lithium carbonate in 120 of water would dissolve four parts of uric acid at the body temperature, and of Uré,[11] who showed that 1 grain of lithia in an ounce of water would dissolve 2.3 grains of uric acid.

Neither his theory concerning the causation of the gouty attacks nor his explanation of how lithium would prevent them can be accepted. In the first place, Magnus-Levy[12] measured the alkalinity of the blood of twelve patients before, during and after the gouty

4. Churchill: Phthisie Pulmonaire, 1858.

5. As a further example of the pseudoscientific jargon indulged in by the hypophosphitists, I may quote the following from a paper by Alcindor (Practitioner, London, 1913, xc, 123): "Prosphorus initiates and promotes among the bioplasmic elements, oxidation of the tissues, which is the primordial phenomenon of vitality, with consequent integration and disintegration and elimination of effete products."

6. Italics ours.

7. Boddaert: Arch. de pharmacod., 1895, ii, 195.

8. Mossol and Gamel: Jour. de pharm. et de chim., 1901, xiv, 337.

9. Panzer: Ztschr. f. Untersuch. d. Nahrungs- u. Genussmittel, 1902, v, ii.

10. Garrod, A. B.: Gout and Rheumatic Gout, London, 1861.

11. Uré: Pharm. Jour., August, 1843.

12. Magnus-Levy: Harvey Lecture, 1910, p. 269.

paroxysm, and failed to find any distinct change in its alkalinity. In the second place, conditions accompanied with severe reduction of the bodily alkalinity, such as diabetic coma or leukemia, do not lead to the deposit of urates. In the third place, acidulating the blood cannot change the solubility of sodium urate without transforming it into uric acid, and the deposit in the joints is not of the acid but of the monosodium urate.

As regards the solvent properties of lithium toward uric acid, while it may be regarded as true that relatively concentrated solutions of lithium will dissolve more uric acid than water, yet in proportions in which it can occur in the blood it exercises no such solvent effect. Krumhoff[13] found that water containing 0.012 per cent. of lithium chlorid would *dissolve less uric acid than distilled water*. Roberts[14] says that he has found experimentally that the addition of lithium carbonate in the proportion of 0.1 per cent. or 0.2 per cent. to blood serum had not the slightest effect in enhancing the solvent power of this medium for sodium urate. Good[15] found that the fatal dose of lithium chlorid for the cat was less than 0.4 gm. per kilogram hypodermically. Supposing that the lithium was equally distributed throughout the various tissues of the body, this would mean evidently a concentration of 0.04 per cent. in the blood. It is manifest, therefore, that lithium if given even in fatally toxic doses cannot increase the solvent power of the blood for the salts of uric acid.

Some have attempted to attribute the supposititious beneficial action of lithium in gouty conditions to its diuretic powers or to its antacid action. As to the former, Good found that lithium chlorid has no greater diuretic power than sodium chlorid. As to the alkalizing properties, while it is true that by the administration of sufficient doses of the carbonate or citrate of this base one can render the urine alkaline, the same thing is true of the corresponding salts of either sodium or potassium. Moreover, there is, to say the least, grave doubt as to the real benefit of alkalies in gout. Roberts says, "I have repeatedly administered the bicarbonate and citrate of potash continuously for three or four years in sufficient doses to maintain the urine persistently alkaline, yet I have seen the arthritic attacks recur with apparently unabated regularity."

It is to be noted that even if we accept Garrod's theories, the use of lithium must be limited to cases of typical gout with paroxysmal attacks of arthritis. Even the blind adherence to these improbable hypotheses affords no reason to believe in its usefulness in the various atypical manifestations of disturbed metabolism which we are in the habit of attributing somewhat loosely to the uric acid diathesis. By the strange irony of chance, in this country at least, the use of the salts of this metal is limited almost exclusively to the latter group of cases.

It is evident, therefore, that science lends no support to the use of lithium in medicine. Any judgment in favor of this element must be based solely on bedside experience. The clinical evidence in this disease is peculiarly unreliable; Magnus-Levy says, "Cool judgment is more difficult in the therapeutics of gout than of any other disease." In the first place, there is no criterion, save possibly the percentage of uric acid in the blood, which can serve as an index of improvement. In the second place, the disease is one which runs a very variable as well as chronic course; there are inexplicable spontaneous fluctuations in the severity of its manifestations. In the third place, the lithium is always employed in conjunction with other therapeutic measures, especially the ingestion of large quantities of water, and it is impossible for any one to say with positiveness whether any improvement which may have occurred has been due to or in spite of the lithium.

Nevertheless, regardless of its manifest fallacy, the lithium superstition still survives. This I believe is chiefly because of the beneficial effects of the so-called "lithia waters" in various conditions of disturbed nutrition. These waters, however, rarely contain more than one part of lithium in a million. That is, to get 5 grains of lithium, the patient would have to drink about 30 gallons of water! While I do not wish to deny the benefit of water in gout, I am quite certain, as must be any other rational human being who knows the facts of the case, that the value of the so-called lithia waters does not reside in their lithium content.

SARSAPARILLA

Various preparations of sarsaparilla, mostly of proprietary nature, are widely used by the public as "blood purifiers." This term is apparently a survival of the old humoralistic pathology which considered all diseases to be due to evil humors in the blood. During the days when this theory was rampant, physicians purged, sweated and bled their patients more thoroughly than wisely in their efforts to eliminate the *materies morbi*. Sarsaparilla has a mild diaphoretic tendency, and might therefore be of some assistance in this eliminative therapeusis. Among the medical profession, however, it never enjoyed any great vogue except in the treatment of syphilis. Today it is used almost exclusively in the form of the compound syrup of sarsaparilla, partly as a means of disguising the tastes of the iodids and partly because of a sort of half belief that it may enhance the antisyphilitic action of mercury.

In regard to the use of compound syrup of sarsaparilla as a vehicle, it may be pointed out that its pleasant flavor is due to the aromatic oils, licorice and sugar which it contains; sarsaparilla itself has a mucilaginous and somewhat bitterish taste, and as far as the flavor of the syrup is concerned is of no advantage. In addition to these ingredients, the compound syrup of sarsaparilla also contains 1.5 per cent. of senna. This quantity of senna is of course too small to have any laxative effect in the doses of the syrup ordinarily administered, and if a laxative action is desirable it is necessary to reinforce the syrup with some cathartic. If, on the other hand, a laxative effect is not desired, the small quantity of senna can serve no therapeutic use and certainly does not improve the flavor of the mixture. As a vehicle, therefore, the combination is quite irrational.

As an antisyphilitic, sarsaparilla was introduced into Europe in the middle of the sixteenth century, having apparently been copied from the South American aborigines. After a brief popularity it fell into desuetude and was but little used until its revival by William Fordyce in 1757. This author[16] reported thirteen cases of syphilis which he treated with the drug with results

13. Krumhoff: Inaug. Diss., Göttingen, 1884.
14. Roberts, William: On the Chemistry and Therapeutics of Uric Acid Gravel and Gout, Croonian Lectures for 1892, London, 1892, p. 129.
15. Good: Am. Jour. Med. Sc., 1903, cxxv, 273.
16. Fordyce, William: Medical Observations and Inquiries, 1757, i, 149.

satisfactory at least to himself. He asserted that the remedy had fallen into disrepute because of the ignorance concerning the class of cases for which it was suitable and the proper method of preparing the decoction; he states that those who had failed with the drug "all erred in macerating it so long in the water before they boiled it, which spoils it for the next day." The only pharmaceutic preparation which he recognized was made as follows: Three ounces of as fresh a sample of the root as obtainable were added to 3 quarts of water and brought to a boil immediately in an open vessel, the boiling continued until all but 2 pints of the water had evaporated, when it was strained and the liquor given within a period of twenty-four hours, usually divided in two or three doses. Frequently it was used in conjunction with some form of external heat, and under these circumstances produced profuse diaphoresis. Dierbach[17] describes the method of using sarsaparilla in the treatment of syphilis as follows: Half a pound of the root cut up fine is macerated with water till it is in a thick slimy condition, and then pressed through a cloth. Of this fluid the patient drinks early in the morning a glassful and then goes to bed, covers up warmly, and sweats for two hours. If he gets thirsty he must drink nothing else but the sarsaparilla slime.

In twelve out of the thirteen cases reported by Fordyce, mercury had been used either before or during the treatment with sarsaparilla, and as he records a case as cured as soon as the external manifestations of the infection have subsided, it is quite impossible to draw any conclusions as to whether or not his treatment really had any effect on the progress of the malady. In the single case in which mercury was not used, the patient was a woman with a syphilitic ulcer of the nose. The author says of the result, "By use of the decoction for fifty days inwardly and outwardly applied as before mentioned, all the sores healed up, some of the bones threw off exfoliations, others covered up without any sensible exfoliation, she recovered her health perfectly with only the loss of the bones of her nose." He himself seemed to have had subconscious doubts as to the efficacy of the treatment, for in reporting another case he says, "But as I durst not in such a case trust entirely to it (sarsaparilla) I now and then used the mercurial ointment to the quantity of half an ounce of quicksilver in the whole." On such a slender thread of clinical evidence hangs the modern use of sarsaparilla as an antisyphilitic!

The only ingredients in sarsaparilla, aside from the mucilage it contains, which could be suspected of possessing any therapeutic virtues are certain glucosidal bodies related to the saponins. As far as has been determined, the sarsaparilla saponins have no effect on the system which is not common to all of this large group of vegetable principles, and the only therapeutic influence that modern pharmacology assigns to the saponins is due to their local irritant effect on the mucous membrane of the stomach. By virtue of the nausea which they produce, they may increase the secretions of the bronchi and of the skin, and are therefore used in some quarters in the treatment of acute bronchitis.

The case for the use of compound syrup of sarsaparilla as an antisyphilitic may be summed up as follows: There is absolutely no explanation of any possible mode of action of the drug. The clinical evidence of the usefulness of sarsaparilla is both scanty and unreliable. Such testimony of beneficial action as does exist is based on the use of doses of from 2 to 4 ounces of sarsaparilla a day; this would be equivalent to about 5 fluidounces of the syrup three times a day. Therefore, in the dose ordinarily employed, there is not the slightest reason to suspect that the compound syrup of sarsaparilla can have any effect on the syphilitic process. As a vehicle it is an illogical jumble.

17. Dierbach: Jour. d. pract. Arznik. u. Wundarznk. (Hufeland's), 1837, lxxxiv, 40.

BASHAM'S MIXTURE

I have no statistics to determine the number of physicians who believe that Basham's mixture is a sort of specific for Bright's disease. The fact that the popular names of the drug and of the disease begin with the same letter of the alphabet seems, to a certain type of mind, final proof that they were meant to go together.

Some years ago, at the time when it was believed that astringents might be absorbed into the blood, ferric chlorid was recommended for the purpose of diminishing the quantity of albumin in cases of parenchymatous nephritis. According to present pharmacologic and pathologic theories, however, this seems neither possible nor desirable.

It is generally held today that the action of astringents is due to coagulation of the bodily proteins. If this view is correct, it is evident that no astringent can exist in the blood, for it would at once precipitate the blood serum, and a fatal thrombosis or embolism would occur. As we are entirely ignorant concerning the mechanism of albuminuria, it is impossible to theorize as to whether, if an astringent could reach the kidney, it would diminish the amount of albumin in the urine. There is not, however, the slightest reason to suppose that to diminish the albumin by any such mechanical means would be of the least benefit to the patient. To hide the rottenness of a beam with a coat of paint does not strengthen the building, nor does the prevention of the excretion of albumin lessen the inflammatory process in the kidney. There are symptoms whose relief is desirable, although we know that in relieving them we do not affect the progress of the disease; but albuminuria can hardly be classed as such a symptom.

I do not wish to be understood as attempting to deny the value of iron in certain cases of nephritis. There is no room for doubt that when Bright's disease is complicated with anemia, as it so often is, the use of this drug is beneficial. This, however, is somewhat beside the question; my main contention is that iron in no form exercises any specific effect on the kidney. It is indisputable that when the renal condition is complicated by anemia, iron, because of its hematinic effect, may be useful; but there is no ground for the superstition that Basham's mixture exercises a special influence. Nevertheless Tyson[18] is forced to remark, "It is prescribed constantly in the most reckless and thoughtless manner."

Dr. Basham, who seems to have originated the mixture of ammonium acetate with ferric chlorid which goes by his name, was no believer in the antiquated astringent hypothesis or yet in the specific antinephritic theory of the effects of iron, for he says in his work on renal disease, published in 1870: "Preparations of iron are the best aid to the blood forming

18. Tyson: Practice of Medicine, 1900.

function. But iron in any of these preparations cannot generate blood corpuscles. They can only be formed out of the nutritious elements of the food." In another place, "A long experience of these and other forms of renal disease where the object of the treatment is similar, has, however, convinced me that a soluble ammonio-chloride obtained by acidulating liquor amonii acetatis with dilute acetic acid, and then adding the tincture of the perchloride, is the most efficacious of all the so-called preparations of steel." I cannot assent to Dr. Basham's dictum that the solution of iron and ammonium acetate is the most efficacious preparation, for while there is no doubt as to its chalybeate power, its acidity and astringency make it peculiarly liable to disturb the digestive tract.

It verges on sophistry to attempt to justify the use of Basham's mixture in nephritis on the ground of its adding the diuretic effect of the ammonium acetate to the chalybeate action of the iron. If a saline diuretic be deemed desirable, it should be given separately so that the dose of one or the other may be increased according to the requirements of the individual case. It is manifestly bad therapeutics to administer a diuretic if not indicated simply for the sake of obtaining the action of iron on the blood.

While on the subject of iron, I feel impelled to say a word concerning the misapprehension as to the effects of this metal on the system. It is not in any proper sense a "general tonic," whatever that phrase may mean; it has one specific therapeutic action, namely, to increase the hemoglobin content of the blood. Outside of this and the local effects of certain salts, there is no known physiologic action of iron which gives any ground for its therapeutic employment.

FERRIC CHLORID

Also I cannot resist saying a word about the use, or rather abuse, of ferric chlorid as a hematinic. It would seem as though large numbers of the medical profession were unaware that there was any other soluble salt of iron known to chemistry, unless they have recourse to the advertised proprietary preparations. The pharmacopeia recognizes a soluble citrate, a soluble phosphate, an iron and ammonium citrate, as well as various compound salts of iron. The chlorid is one of the most highly astringent preparations of iron which we have, and therefore liable to cause constipation. It is strongly irritant to mucous membranes, and in delicate stomachs will often provoke nausea. The widespread employment of various proprietary forms of iron is due largely to the dread of disturbing the patient's digestive tract with the inorganic salts, a fear which is the outgrowth of unpleasant experiences with the tincture of ferric chlorid. I have heard a physician who passes among his fellows as being exceptionally educated speak of this solution as the "strongest" form of iron. What he meant I have been wondering ever since. As a matter of fact, 10 minims of the tincture of ferric chlorid contains less iron than a single Blaud's pill. As an external remedy for checking hemorrhage it is very valuable; as an internal drug it should never be employed.

OPIUM AS A LOCAL REMEDY

There is many a man who, while denying any accusation of being superstitious, nevertheless hesitates to make the thirteenth person at a table, or who has some pet habit which he regards as an omen of good luck. In a very similar way there are many physicians who profess to realize that opium has no local action but nevertheless persist in employing it as a topical remedy. And there may still be some superstitious enough really to believe that a drug so potent as a cerebral depressant must of necessity have powerful local effects. Among the most common evidences of this belief may be mentioned that ancient, if not honorable embrocation known as lead water and laudanum, the addition of opium to nutrient enemas to quiet the rectum, but above all the use of the opium suppository in various pelvic inflammations. The first of these has perhaps a slight theoretical justification, but the other two are as senseless as the incantations with which the ancients preceded their nauseating concoctions.

Crude opium frequently has a marked local irritant effect. The United States Dispensatory says, "When long chewed it excites much irritation in the lips and tongue and may even blister the mouths of those unaccustomed to its use." Dr. Hill in his history of materia medica, published in 1751, remarked of opium that "if kept long on the skin it takes off the hair and it always occasions an itching in it; sometimes it exulcerates and raises little blisters if applied to a tender part," and he recommended its use as a counterirritant. I have myself seen two cases in which blistering followed the local application of lead water and laudanum, but whether as a result of this application I cannot say.

Of course a counterirritant would likely be beneficial in various forms of arthritis in which Goulard's extract is commonly employed, and theoretically the counterirritant effect of opium might be beneficial. To this sophistical defense, however, it may be replied in the first place that we have a host of other counterirritants more reliable and safer than opium, and secondly, most of those who use it seem to do so with the idea that the opium will add anodyne or antiphlogistic effect to the astringency of the subacetate of lead. Of the local anesthetic action of opium I shall speak in a minute, but first let me digress briefly to say a few words on the astringent action of the leaden half of this medieval embrocation.

While it is true that lead acetate is an astringent, when applied over the skin its astringent action must be expended altogether on the superficial layers of the epiderm. Moreover, as is well known, when the lead is combined with the opium, it is precipitated as an insoluble meconate. Although some of the older writers attributed mysterious virtues to lead meconate, there is no reason to believe that it possesses any properties not common to the insoluble salts of the heavy metals, such as bismuth subnitrate. The improvement which follows local applications of lead water and laudanum is due in part to the lint and bandages which hold it in place, perhaps slightly to the alcohol, but chiefly to the action of time which passes by while the application is left in place.

When for any reason the ingestion of food must be interdicted for a considerable period of time, and an effort is made partially to maintain nutrition by the use of rectal feeding, the physician is confronted with the difficulty that the rectum soon becomes irritated, and ejects the enema before the nutrient it contains can be absorbed. To prevent this nearly every textbook on medicine recommends the addition of tincture of opium to the enema. This recommendation is based on the belief that opium, by virtue of its local anesthetic effect, will so benumb the mucous membrane of the bowel that it will not feel the presence of the

nutrient injection. On what this belief in the local anodyne effect of opium is based I do not know, nor do I believe that its adherents themselves have any definite idea of the origin of the fable. It is true that Wiki[19] found that the injection of the alkaloids of opium beneath the skin lessens the activity of peripheral sensory nerves. In his investigation potassium carbonate proved itself a more powerful local anesthetic; but how many would trust to potassium to calm the peristalsis of the rectum?

It may seem impiously iconoclastic to doubt the hallowed superstitions of the opium suppository. There appears to be in the minds of those who use it a subconscious delusion that as the rectum is nearer to the pelvic organs than the stomach, the opium must act more powerfully on this portion of the body when given by suppository than when given as a pill. As a matter of fact, however, physiologically the rectum is farther away from the pelvis than the stomach. For opium placed in the rectum to reach the bladder, it must be absorbed into the circulating blood and carried up to the heart and back again through the arterial system to the pelvis, and as the distance from the stomach to the heart is less than from the rectum to the heart, it follows that physiologically the stomach is nearer to the bladder. Moreover, were it possible for the morphin of an opium suppository to penetrate the layers of mucous membrane, connective tissue and muscle which separate the interior of the rectum from that of the bladder, it would have no effect on the latter organ, for the anodyne action of morphin, as of the other alkaloids of opium, is purely central. An opium suppository relieves the pain of a pelvic inflammation in the same way that a hypodermic injection of morphin does, by being carried to the brain and benumbing the perceptive centers.

CONCLUSIONS

I have considered in some detail the fallacies of a few common practices not because they are the only, or even the worst, examples of the lack of judicial spirit in therapeutics, but merely to illustrate by concrete illustrations how inadequate is the data to justify the use of some popular drugs. It would only weary the reader and serve no useful purpose to trace the history of such remedies as chimaphila, cypripedium, taraxacum, eupatorium, scutellaria, xanthoxylum, wild cherry, cactus, and a host of other contributions of the Thompsonians and the American Indians to our materia medica. I should like to emphasize, in closing, the explanation of the origin and survival of these practices. Man, despite his education, is still a superstitious animal. Two or three years ago a well known psychologist made a poll of the faculty of Harvard University and found that a majority of these men, representing the highest type of intellectual development, were willing to confess to a more or less profound belief in some pet superstition as foolish as the old notion of a black cat or a broken mirror as the harbinger of misfortune. If a patient with pneumonia recovers when we sprinkle the bed with sawdust why not sprinkle the beds of all pneumonia patients? When we combine apiol with ergot and the menorrhagia ceases shall we not attribute mystical synergistic powers to the apiol?

Herein lies one reason for the survival of many of these therapeutic superstitions, namely the simultaneous exhibition of inert and potent drugs and then assuming that the diluent has played some part in the effects. The so-called Towns treatment for the morphin habit includes a mixture of hyoscyamus, belladonna and xanthoxylum; but dare anyone with any knowledge of pharmacology attribute any part in the results of this concoction to the fluidextract of prickly ash? A host of these vegetable "simples" owe their reputation to the fact that they are almost universally exhibited with some real remedy.

Another group of drugs owes its vogue to the exploitation by manufacturers of proprietary preparations. When day after day, from glowing blotters on our desk, from pages in our medical journals, in blackest type, glares out boldly the statement that so-and-so's extract of viburnum cures amenorrhea or that somebody's else elixir of euphorbia cures bronchitis, it is a man of more than ordinary intellectual firmness who will not come to believe it. Few men realize how potent is suggestion, or how many of their beliefs are based on the dogmatic assertions of others, rather than on reason.

It is well that all physicians should from time to time analyze the reasons for the therapeutic faith that is within them. Especially searching should be the self-examination of those who are looked up to by their confrères or pupils as authorities, and unflinching should be their determination to recommend no measure of whose utility they cannot give material evidence, either scientific or empiric.

1905 Chestnut Street.

19. Wiki: Arch. internat. d pharmacod., 1911, xxi, 415.

MEDICAL EDUCATION WITH REFERENCE TO RURAL COMMUNITIES

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Medical education and premedical education have for some time been matters of interest and study to physicians and educators, and lately have been brought to the attention of our legislatures through the appeals of medical colleges for funds necessary now to conduct modern schools, the time being long past when the fees of the students were sufficient to pay the necessary expenses. To many of us it appears that the time is rapidly drawing nigh when these questions will become of vital interest to the rural citizen through the failure of the schools to supply the necessary number of doctors to satisfy the wants of rural communities.

I, myself, though under 40 years of age, have seen during my adult life practically the whole history of the advancement of medical standards in this country. Twenty years ago when I was a student at the University of Virginia (which is a Class A school) there were no entrance examinations, nor were preliminary educational requirements demanded of those who desired to enter on the study of medicine, and after two years' residence in the medical school, and the doing of satisfactory work, a man was given the degree of M.D.

No sane physician denies that there was the greatest need of regulating the right to practice medicine, and to raise the standards of educational qualifications of those who desired this right. The only criticism

that has been heard to come from those who had a right to express their opinion is that perhaps there has been too great rapidity in raising the standard, and that the time has come when the raising of the standard shall be done less abruptly and with more thought for all who may be concerned.

There is no question that today the American people are receiving vastly better medical attention than they did ten years ago, but already the cry for a doctor is coming from rural communities, and they are asking for a good doctor if possible, but in any case "a doctor."

The report of the Carnegie Foundation on medical education in the United States and Canada is certainly praiseworthy, and did an immense amount of good in weeding out "diploma-mills" and purely commercial medical schools. Unfortunately, in such an exhaustive study of medical conditions there appears too frequently the spirit of the advocate rather than that of the judge, and this is noteworthy in comparing the conditions underlying the practice of medicine in this country and in Europe. In such a comparison there are certain important factors which have been entirely overlooked. While the ratio of physicians to population has been considered, little or nothing was said as to the relative morbidity in Europe and in the United States, and that there is a great difference is at once noted by the statistician when the mortality rates of Germany, France, Austria and England are compared with those of the registration area of the United States. For example, the typhoid rate in the United States is over 2 per 10,000 living, while in England it is only 0.5 per 10,000 living. After studying medicine in Baltimore hospitals for five years, where I saw the wards filled with typhoid patients, I can well remember my surprise in not seeing a single typhoid patient in the Strassburg hospital during what we, in this country, commonly call the "typhoid season." Another important point which has a bearing on the ratio of physicians to population is the per capita wealth of the community, which is much greater in the United States than in Europe. The two factors mentioned above are important ones, and must be considered with many others, such as sickness insurance, when one estimates the number of physicians required by a given number of people.

My personal opinion with reference to medical education has been that there is need in this country of two classes of medical schools, the one, modeled after the Johns Hopkins, in which the requirements can hardly be set too high, the other and larger class for the training of the practitioners of medicine. The first type of school should have an absolutely self-limited number of students, and they should be thoroughly trained not only in clinical and laboratory medicine, but also in the methods of research. Naturally, the men who graduated from such a school would become teachers, research workers and specialists, and practitioners and consultants in the larger towns and cities. I have always felt that after a man has spent four years at college and four years additional at a good medical school he would be unwilling to settle at the "cross roads," but would rather starve in a larger community where his mental appetite, if not his physical, would at least be satisfied. To require the foregoing of all men who desire to practice medicine would undoubtedly raise the standard of the profession, but I fear that in the "long run" it would prove no more satisfactory than to require that all locomotive engineers should be graduates in mechanical engineering from an approved college.

The second type of school, in my opinion, should demand for admission that the applicant be really grounded in the essentials of a good education, namely, the requirements demanded for admission to most colleges in English and its branches, history, mathematics and, in addition, the fundamental scientific branches underlying medicine, such as chemistry, physics and biology. I myself cannot even see the absolute need of an ancient or a modern language, as even we who have "qualified" once on a time in a modern language have so forgotten it that we rarely make use of it as a help in our professional work. Every doctor who looks at this question from an absolutely common sense standpoint realizes that the knowledge of a modern language is a help but never an essential.

The second type of school should give a full four year course, and the work should have little of the elective in it. The clinical and laboratory courses in such a school should be of the very best, but the time devoted to research by the student should be limited to a minimum. Any one who has to take part in the arranging of the schedules of work to be done by medical students knows what a problem it is, and knows that the problem consists, not in finding subjects to teach, but in finding the time in four years to give the student even a satisfactory foundation.

TABLE 1.—PHYSICIANS PRACTICING IN RURAL MARYLAND (1914)

Counties of Maryland	Graduates of				
	University of Maryland School of Medicine	College of Physicians and Surgeons	Baltimore Medical College	Johns Hopkins Medical School	All Other Medical Colleges in United States
Allegany	10	5	1	0	13
Anne Arundel	23	4	2	1	13
Baltimore	63	13	10	0	18
Calvert	4	5	1	0	1
Caroline	12	5	1	0	4
Cecil	11	3	3	0	14
Carroll	32	4	3	1	12
Charles	8	2	2	0	1
Dorchester	13	4	5	0	7
Frederick	32	2	6	0	13
Garrett	9	0	0	0	6
Harford	23	3	0	0	9
Howard	10	4	1	0	4
Kent	5	3	4	0	11
Montgomery	15	4	2	0	16
Prince Georges	13	9	2	0	21
Queen Annes	7	3	2	0	6
St. Marys	11	2	1	0	6
Somerset	11	1	2	1	9
Talbott	15	2	2	1	4
Washington	8	3	6	0	17
Wicomico	8	3	2	0	9
Worcester	8	4	1	0	12
Total	350	88	59	4	226

Physicians in rural Maryland, 727.
Ratio to population (709,000), 1: 975.
Graduates of what is now the University of Maryland School of Medicine and College of Physicians and Surgeons in rural Maryland, 497.
Number of doctors graduated from Johns Hopkins from 1897 to 1913, inclusive, is 965, of whom four have settled in rural Maryland.
Graduates of all other medical schools in rural Maryland, 226.

At present the Johns Hopkins and certain other schools are examples of the class first mentioned, and these, of course, are, and will be, uninfluenced by the requirements of any governing body; but the second group would be the ones affected by rules regulating premedical education.

On page 45 of the Carnegie report it is noted as a fact that graduates of the Johns Hopkins have settled in small communities. I have made a study of the physicians practicing medicine in rural Maryland,

defining "rural" according to the United States census as those communities having less than 10,000 inhabitants. The basis of my figures is the directory (1914) of the American Medical Association. The results of the study are enumerated in the appended tables. I have arranged in Table 1 the number of physicians practicing in each county in Maryland (the four cities of Baltimore, Frederick, Cumberland and Hagerstown omitted), and have subdivided them according to whether they graduated from the Hopkins or from one of the other three Class A schools, the University of Maryland School of Medicine, the College of Physicians and Surgeons, and the Baltimore Medical College. It will be noted that in spite of the fact that the Johns Hopkins Medical School is situated in Maryland, there are only four of its graduates practicing in rural Maryland, while there are 350 graduates of the University of Maryland School of Medicine, eighty-eight graduates of the College of Physicians and Surgeons and fifty-nine graduates of the Baltimore Medical College who are practicing medicine in the Maryland counties.

TABLE 2.—PHYSICIANS IN RURAL MARYLAND (1914)
Graduated since 1896

Counties of Maryland	Graduates of				
	University of Maryland School of Medicine	College of Physicians and Surgeons	Baltimore Medical College	Johns Hopkins Medical School	All Other Medical Colleges in United States
Allegany	3	0	0	0	4
Anne Arundel	12	2	1	1	6
Baltimore	23	4	7	0	11
Calvert	2	1	1	0	1
Caroline	7	1	0	0	1
Cecil	7	1	1	0	3
Carroll	11	0	1	1	5
Charles	4	0	1	0	1
Dorchester	8	2	1	0	4
Frederick	13	0	5	0	5
Garrett	5	0	0	0	5
Harford	9	1	0	0	4
Howard	4	2	1	0	0
Kent	0	3	2	0	3
Montgomery	4	1	0	0	8
Prince Georges	5	1	0	0	9
Queen Annes	4	1	2	0	0
St. Marys	1	0	1	0	3
Somerset	5	0	1	1	4
Talbott	5	1	1	1	2
Washington	0	1	3	0	4
Wicomico	4	0	2	0	8
Worcester	4	3	0	0	6
Total	140	24	31	4	97

Hopkins graduates (1897-1913)	965;	in rural Maryland	4
U. of M. graduates (1897-1913)	1,225;	in rural Maryland	140
P. & S. graduates (1897-1913)	1,029;	in rural Maryland	24
B. M. C. graduates (1897-1913)	1,330;	in rural Maryland	31

	1905	1915
Graduates: U. of M., P. & S., B. M. C. (combined)	249	128
Freshmen: U. of M., P. & S., B. M. C. (combined)	263	44

Table 2 is perhaps more illuminating, as it shows those graduating from these four schools since 1897, the year in which the Johns Hopkins graduated its first class. As will be noted, in the sixteen years from 1897 to 1913, inclusive, the Johns Hopkins Medical School graduated 965 men, of whom only four are practicing medicine in rural Maryland. During exactly the same period the University of Maryland School of Medicine graduated 1,225, 140 of whom are practicing medicine in Maryland outside of the cities.

I believe that these figures justify my belief that the graduates of a school like the Johns Hopkins will only exceptionally settle in the country, and that if we want physicians who will practice in the country, we must make the premedical requirements less exacting *in time*, although perhaps they may be raised somewhat along certain lines above today's standard, and any increases in the requirements must be made slowly and gradually and only after most careful study of all possible consequences.

It may be noted that in the Carnegie report, in 1909 there were seven medical schools in Baltimore, one Class A plus school, the Johns Hopkins Medical School; three Class A schools, the University of Maryland School of Medicine, the College of Physicians and Surgeons and the Baltimore Medical College. The other three schools were not in Class A, and ceased to exist some years ago. Today there are only two medical schools in Baltimore, the Johns Hopkins Medical School, and the other three Class A schools merged into one under the name of the "University of Maryland School of Medicine and College of Physicians and Surgeons." The decrease in medical graduates in this state is well shown by the fact that the merged schools mentioned above graduated 249 in 1905, while in 1915 they graduated 128. A more accurate prophecy can be made by comparing the freshmen classes of these combined schools, there having been 263 freshmen in 1905 and only forty-four in 1915.

A growing country cannot be supplied by a diminishing output of medical practitioners. We are facing a real and dangerous shortage. This will become manifest when the present small classes are graduated, and the need will be emphasized by the large number of physicians required for an enlarged army and navy, and the putting into force of the whole-time county health officer advocated today by many authorities on public health.

I do not present this paper as an argument for lowering standards, but simply as a study of local conditions, with the hope that progress in regulating medical training will be done thoughtfully. As President Pritchett of the Carnegie Foundation says, "Furthermore, let us not forget in our zeal for research that the principal function of the medical school is the training of medical practitioners."

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SOME FURTHER DEVELOPMENTS IN A PEDIATRIC DEPARTMENT OF A UNIVERSITY MEDICAL SCHOOL*

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The history of the growth of pediatrics in this country is an interesting one, starting as the subject did as a subdivision in medicine, and developing gradually until in many medical centers it is now accredited as a separate department, and offers in many schools positions for full time teachers of pediatrics parallel with positions in medicine and surgery. Its growth from a purely academic standpoint is of considerable interest and importance. At first the field of pediatrics was limited mainly to that of infant feeding, and growth along this line has probably been greater and more efficient than in any of the other subjects in pediatrics. In almost every university medical school the subject of infant feeding has been developed

* Revision of papers read before the Section on Preventive Medicine and Public Health, at the Seventh Pan-American Medical Congress, June 19, 1915, and before the American School Hygiene Association June 25, 1915, San Francisco.

soundly and broadly, not only in the laboratory, in the hospital and the outpatient department, but also in connection with milk stations and follow-up work. This growth has been rapid and gratifying to all those who have had an opportunity to follow the development in its entirety, and such a growth should set the standard for the development of the other legitimate fields in pediatrics, for it is only by the unification of laboratory, hospital and social factors that any of the problems of child welfare can be worked out satisfactorily. The medical schools, even in this field, have differed in the emphasis put on these three lines of development. In some schools the purely teaching phase has predominated, while others have dwelt largely on research work in infant metabolism, and again, the social work has lagged far behind. But from the field of pediatrics as a whole, certain high standards have emerged along all lines, and not the least of these is the child welfare social work as it is being carried on by the New York Milk Committee and by the pediatric departments of Harvard and Western Reserve universities.

The emphasis on infant feeding and the splendid development of the early problems of nutrition have led, at length, to a study of the periods of early and late childhood, and to the importance of dietetics in the prevention and treatment of disease during those periods of child life. It is just here that the pediatric department needs a close relation with the department of nutrition and dietetics in the university. It is a difficult matter in a large clinic to work out individual dietaries for patients, but with the assistance of trained dietitians and graduate students in dietetics, it is possible in a hospital outpatient department to obtain more rapid and satisfactory results. The pediatric department, on the other hand, offers to the department of nutrition a practical laboratory, so to speak, filled with concrete problems, and thereby lends an immediate focus to the class-room work in dietetics, and adds a field for practical experience.

The familiarity with development and growth and the studies in these subjects are constantly opening newer and wider fields for investigation and teaching. The realization of the relation of internal gland secretion to physical and mental development indicates that great progress in this field is to be expected. Recent studies in this field indicate many lines for research work which must be the ground work for future conclusions, and which necessarily carry a purely medical department into fields better developed at present in academic departments. The importance of an early recognition of mental defectiveness or the early origin of mental disturbances arising during the period of adolescence demand a broader and more comprehensive handling of the subject than most medical schools are today prepared to give, owing to the fact that few medical men have had a sufficiently wide training in psychology. The academic department of psychology is prepared to give most valuable assistance to the subject of pediatrics. The abnormal psychology of the child and its physical manifestations and retardations are a part of the pediatric field which needs the affiliation with the field of psychology. The outpatient department is constantly offering material for such united study.

The mentally defective child or the mentally retarded child is the reason, furthermore, for a certain line of development in medical social service which has spread rapidly throughout the country. The juvenile delinquent has brought into existence the juvenile court, and the juvenile court recognized almost immediately that any service it might render the child must be based on the medical and psychologic study of the case; and the psychologic study does not end with the mental grading of the child. To stop there forces the court to act on incomplete data. The psychologist must study the possibilities and potentialities of the child, and be able as far as it is possible to interpret futurities in mental processes.

The further development of medical social work points very clearly to a close relation between the medical field and the academic department of social economics. The whole modern trend of medicine is toward a vital part in social and economic fields, and the progress of medicine in those fields calls for a sound basis of development; this means that the workers going into this field must be thoroughly trained from the medical standpoint as well as that of social economics. Unless such work is standardized and put on a higher plane, the splendid field of medical social service may be delayed and limited in its development. To avoid this the direction of the medical social service department might come directly under the supervision and guidance of the head of the departmen of social economics in the university, and this contact would bring before the heads of such departments the larger opportunities at their disposal for the training of their students. Such a plan is in operation now with the department of social economics in the University of California, and the director of social service in the pediatric department of the medical school is not only a graduate in medicine but is also connected with the department of social economics, thus uniting the two departments and offering to the advanced students in the academic as well as the medical department an opportunity to do field work as part of their social economic training. This scheme of interrelationship ought eventually to produce workers with a good foundation not only from a medical standpoint but also from that of academic social economics.

The department of education is another natural point of contact with the pediatric department, as a large field of educational problems depends on the mental potentialities of fairly large groups of children now attending public schools, and the modern field of education has widened to include all children, normal and abnormal, and a hospital school for defectives would offer invaluable practice work for the department of education. The special pediatric clinic for speech defects among children offers still further opportunities for teachers in training in the department of education.

The department of physical culture, occupying so large a place in all university life, would gain much in wider opportunities for the student by an interrelationship with the pediatric department, and would give much to the development of that department's physical corrective field.

Thus far the pediatric department of the University of California Medical School has established a close relationship with three academic departments of the university; a trained psychologist is a member of the pediatric staff and at the same time holds a position in the department of psychology, the department of social economics, already referred to, and the department of nutrition and dietetics. The usefulness of

these departments has been mutually broadened, and the work of educating the necessary workers for these fields has been put on a stronger basis.

The development of pediatrics has brought other more obvious relationships with the large community problems. Work in the contagious diseases and many of the infections, which are more often encountered in infancy and childhood than in later years, is receiving attention from the teaching standpoint as well as from that of research, which is necessary for healthy growth in any line. This growth is not nearly so advanced as it is along the lines of infant nutrition and development. However, with such work as the Rockefeller Institute and Hospital have contributed to these subjects in the control of meningitis and the study of infantile paralysis and pneumonia, as well as the brilliant results obtained by the use of antitoxin and vaccination, growth along these lines has taken on a much broader aspect. To study these types of infectious diseases connection can be made between pediatric departments and local and state boards of health which are in constant touch with the larger community problems. It is only by a close cooperation of hospital and laboratory with medical school inspection and boards of health, both local and state, that these larger questions of control of infection are going to be satisfactorily solved. It is, therefore, fitting that a state institution should interest itself in these larger problems relating to child welfare, a responsibility and duty which is inadequately met at present. The need for and advantage of cooperation between pediatric departments and all public and quasipublic institutions dealing with the problems of infancy and childhood has already been demonstrated in many centers. There is hardly a large or well organized department of pediatrics which is not sought after for advice by children's institutions either for regular medical supervision or at least in times of sickness.

The advantage of such relations with a department of pediatrics, rather than with individual physicians, stands out clearly to all who deal with either side of this question. It gives the institution seeking aid uniform medical supervision and the advantages of laboratory and hospital equipment, which from individual physicians can be obtained only in an often unsatisfactory way or to a limited extent. Such institutions as infant shelters or homes for orphans or destitute children and children's charitable associations, by having a definite connection with a pediatric department, not only have the advantage of the usual medical inspection, but should also have the advantages of all the other lines of activity controlled by the department, such as social service, investigation of children before admission to the institution, continuous medical supervision and psychologic examinations.

A point of contact which very few pediatric departments have made, and one which is of importance, especially in a state university, is with the juvenile court, state reformatories for juvenile offenders and state homes for feebleminded children. This side of pediatric studies has been so far neglected by most American pediatricians. As for the teaching of borderline psychopathic conditions and mental defectiveness, very few of even our first class medical schools today offer any satisfactory course in these subjects, and as a result there are few investigators along this or any of these allied subjects.

The intimate connection between the problems of the defective child, the home and the school, as well as the problems of delinquency and economic efficiency, all combine to make a most attractive and important field for investigation. To carry on such work satisfactorily, a pediatric department should have a definite connection with institutions, city and state, which handle defective and delinquent children, such as the city schools for backward children, the state homes for the feebleminded and the juvenile court. The pediatric department of the University of California Medical School has established a close affiliation with the juvenile court, where all cases of dependency and delinquency receive not only a physical examination but also a mental examination on the basis of which a court report and recommendations are made. Only by such close connections can these problems be worked out satisfactorily both for the individual and for the state.

An even wider application of this work can be carried out by connection with our school boards, making composite studies of various schools where the problem of the backward child or of children who present various educational problems arise. Such a problem as that of children coming from the immigrant class is especially important not only from a psychologic standpoint but also in the working out of a better school curriculum on a broader psychologic and educational basis. Such studies are at the present time being carried on through a cooperative scheme between the board of education, the department of medical school inspection and the pediatric department of the University of California Medical School. A report of some of these studies will be made later, but their importance will be evident to any one who has a realization of this field of child welfare work.

Further points of contact between a pediatric department and the larger problems of childhood would be a more intimate connection with the recreational and vocational problems which are now being studied in all progressive communities. Unless the medical educational centers take an interest and cooperate in such fields of progressive endeavor, our development will necessarily be more or less one sided. Of course in a pediatric department, teaching students the development as well as the diseases of infancy and childhood is first and most fundamental; but no pediatric department should feel satisfied to stop in its growth by simply developing its teaching and research work. The larger community problems should be taken up as one part of our complete growth.

Therefore, it is incumbent on medical schools to offer just as wide and practical a field to their students as possible, and for the future physician, the broader the contact with concrete problems during his period of training, the sooner will he be able to make his own definite contribution to medical life as he in turn meets it in the home, school, hospital and community. For the physician today who goes out of our medical schools without realizing some of the broader applications and fields of usefulness now open to medicine is not only incompletely informed as to the modern trend of medicine, but is also handicapping the advance of medicine as one of the great educational and social factors in the development and betterment of our race and humanity.

Proof of Talent.—It is a great proof of talents to be able to recall the mind from the senses, and to separate thought from habit.—Cicero.

APPENDECTOMY UNDER LOCAL ANESTHESIA

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Although we have for years been gradually widening the field of operation under local anesthesia, the peritoneal cavity has for most surgeons been a deterrent factor. When we consider how often we operate for hernia under local anesthesia (I myself have repeatedly done intestinal resections in strangulated hernias, inguinal, femoral, and umbilical, under local anesthesia), it seems strange that we should not long ago have added appendicitis to the list of operations to be done in this manner. I think the dread of pain in handling the peritoneum and the abdominal contents has in great measure held us back.

In the past eleven months I have operated in fifteen cases of appendicitis under local anesthesia, and the results have been so satisfactory to myself, as well as to the patients, that I venture to report them, with the full expectation of calling forth numerous theoretical objections, and in the end finding many followers.

The first great objection will be the difficulty in dealing with adhesions. The adhesions we find are of two classes, fibrous and omental. The fibrous adhesions are not sensitive and can be readily divided. The omental adhesions can be readily anesthetized by injecting into them a few drops of the local anesthetic. In a few minutes the adhesions can be ligated and divided without any pain. A few of my cases have been acute, one an empyema of the appendix; the remaining cases have been subacute or chronic. The right tube and ovary can be drawn into the wound and can be resected or excised if necessary. I hope in the near future to use this method in more and more acute cases, even in the presence of a peritonitis. In fact, a peritonitis, far from being a contraindication to doing the operation under local anesthesia, will, I hope, soon be an indication for this operation. When we consider that the system is already struggling to throw off a peritoneal infection, and that the organs of excretion are doing a large part of this defensive work, the danger of handicapping these organs still further by giving an anesthetic is apparent to us all. And if we can remove the offending appendix in the presence of a peritonitis under local anesthesia, we are giving our patient a far better chance for a rapid recovery.

There is another important point. We all know how peristalsis is inhibited after abdominal operations under ether, and how serious a complication tympanites may become. In the cases in which I have operated under local anesthesia, there has been very little or no tympanites, and peristalsis has been little or not at all inhibited. In a recent case of empyema of the appendix in a young woman, gas began to be passed fifteen hours after operation, and at no time was there any abdominal discomfort; nausea, vomiting and tympanites were entirely absent. In another recent subacute case the patient was reading the newspaper on the day after operation.

Three of my cases were intelligent private patients, and the remaining cases were from the First Surgical Service of Mount Sinai Hospital. Each patient was asked if he or she was willing to have the operation done under local anesthesia. Some of the patients were neurotic women, but most of them were fairly intelligent. Of course, the cooperation of an intelligent patient is an advantage, and I would hesitate to do the operation on a young child.

I was led to do this work by the following case:

Mrs. W. M. R., a patient of Dr. Alfred Schwab, had an acute attack of appendicitis in March, 1915. She had a bad heart, with a pulse up to 120, a marked nephritis, enlargement of the liver and ascites. When I first saw this patient with her doctor I refused to operate on her. On the following day the symptoms of acute appendicitis became more severe, and I decided to try to remove the appendix under local anesthesia. The patient, a very intelligent woman, kept up a running conversation with us during the operation; and, when it was completed, she assured us that the pain had been trifling. I saw this patient recently and she was in very good condition. Had the operation been done under ether I fear we would have had a far different result.

With increasing experience I have modified the technic somewhat. In my earlier cases I used the local anesthetic only in the abdominal wall. But we found that most patients complained, either when the appendix was being drawn into the wound, or when its mesentery was being ligated.

The technic which I now employ is as follows:

Half an hour before the operation the patient receives a quarter of a grain of morphin hypodermically. I usually use a 1 per cent. solution of novocain, to an ounce of which 20 drops of 1:1,000 solution of epinephrin are added. As much as 240 minims of this solution can be safely used for an adult, which would correspond to about 2½ grains of novocain. As a matter of fact, I have never found it necessary to use anything like that amount to do a painless appendectomy.

I have for years had a personal preference for the muscle splitting McBurney incision, and use it in most of my cases, acute as well as chronic. This incision lends itself particularly well for the operation under local anesthesia. The skin near the anterior superior spine is not very sensitive; but by far the greatest advantage of an incision in this location is the fact that it comes right down on the cecum. Rarely is it necessary to pack away the small intestines (although this can readily be done without causing pain), and there is thus less handling of the intestines. I first inject the novocain solution *into* the skin along the line of proposed incision. In doing this I try to blanch the skin with the injected solution. Then I inject under the skin, along the same line.

After a wait of three minutes, the skin and subcutaneous tissues are painlessly incised down to the aponeurosis of the external oblique. A sharp scalpel is used for dividing all layers, as scissors, being blunter than a knife, are more apt to cause pain. I next inject the novocain under the external oblique aponeurosis, and after two minutes divide it. The solution is next injected into the internal oblique muscle, parallel to the fibers of the muscle.

After another wait of a few minutes the internal oblique is cut parallel to its fibers. We then inject a little novocain under the peritoneum and wait fully three minutes before dividing it. If done in this way, there will be no pain up to this point. All manipulations should be as gentle as possible, on the part both of the operator and of the assistants. It is rarely necessary to apply artery forceps in opening the abdomen through this incision, which is an additional advantage,

as the crushing of the blood vessel with forceps may cause some pain, unless the novocain is injected around the vessel. If necessary a packing can be introduced to keep the small intestines out of the way, although it is rarely necessary with this incision.

As soon as the cecum with the appendix is exposed, some novocain is injected into the mesenteriolum. If this is not done, and I omitted to do it in my earlier cases, the patient will complain of cramplike abdominal pain referred to the navel or pit of the stomach. By anesthetizing the mesenteriolum this pain is obviated. After a wait of three minutes the appendix can be pulled out of the abdomen, the mesentery ligated and divided, and the appendix removed with almost no pain. It is not necessary to inject novocain into the base of the appendix before ligating and removing it. If the mesenteriolum is properly anesthetized, there will be no pain during the removal of the appendix. It is perfectly feasible to draw the right tube and ovary into the wound and do any operation on them that may be indicated. The abdomen is closed layer by layer in the usual manner and, if the technic has been correct, the closure of the wound is entirely painless.

I have kept a record of the statements of the patients concerning the amount of pain they felt during the operation. Most hospital patients will say that they felt some pain, but much less than they expected. My three private patients have all assured me that the operation was quite painless.

The postoperative course is of much interest. A few hours after operation there is a little wound pain which is readily controlled by codein or morphin. Peristalsis is regularly established early, in from fifteen to twenty-four hours, so that the troublesome and painful postoperative distention is completely absent. I have recently had an acute case in which during the entire convalescence no rectal tube was inserted and no enema or cathartic was given. This patient had not the slightest sign of nausea, had fluids up to a few hours of the operation, and continued to take fluids after operation; yet the operation was done in the acute stage, and pus was found inside of the appendix. Almost all of the patients have been able to take and retain fluids within a few hours after the operation. The postoperative depression so common with ether is entirely absent. Most patients are reading on the day after operation, and are sitting up in bed on the third or fourth day; in short, smooth and rapid convalescence, even in the acute cases, is a most striking phenomenon. The patients are usually able to get out of bed on the fourth or fifth day, and are ready to leave the hospital between the seventh and ninth days. Performed properly, the operation consumes more time than when done under ether; but when one is working under local anesthesia, time is not an important element.

In the ordinary uncomplicated case of appendicitis, the operation can be performed under ether in from ten to twelve minutes. Under local anesthesia it takes from twenty to thirty minutes. Much of this time is consumed in waiting for the anesthetic to act on each layer, skin, aponeurosis of external oblique, internal oblique muscle, transversalis fascia and peritoneum, and mesenteriolum. In all, from twelve to fifteen minutes are consumed in waiting. Furthermore, all manipulations must be of the gentlest, and only a sharp scalpel should be used in dividing the various layers of the abdominal wall.

I have described the operation as done through an intermuscular incision, but the operation can also be done under local anesthesia through any of the other incisions for removing the appendix. For the reasons stated above, I believe the incision I have used to be the most desirable.

NOTE.—Since writing the foregoing, I have operated in three additional cases of appendicitis under local anesthesia. With increasing experience, I feel more and more confident that its sphere of usefulness will be greatly extended. The presence of adhesions, or of a diseased tube and ovary, is no contraindication. I would not advise the procedure in young children or in the presence of a large mass.

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THE ETIOLOGY OF STUTTERING

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The sufferers from this affliction have looked to the medical profession for relief since the existence of that profession, and have looked in vain. While medicine has made almost unexampled progress in the understanding and treatment of known diseases, and has added to the list of those that were formerly unknown, regarding this old, old malady, whose record dates back at least to the Egyptian hieroglyphics, there is in the medical world of today little more than a confusion of personal opinions and theories. The amount of scientific experimentation on which these theories are based is wholly inadequate. There are physicians in plenty who still make a practice of dosing stutterers with nerve medicine. I have never known whether they were following from habit the humanitarian impulse to give relief by the methods to whose use they have become trained, or whether they really expected the remedies to effect a cure. If the latter alternative is the true one, then the physician is surely relying more heavily on what he thinks the medicine ought to do than on actual experiences with what it has done, for after a number of years of study of this question I have so far failed to find the record of a single patient cured by such treatment. Is there any other instance in the history of therapeutics in which the physician has been so slow to discontinue the use of an unsuccessful remedy? Is this instance due to the persistence of the metaphysical dogma of organic causes for all diseases?

When the physician does not feel himself justified in the administration of drugs he is frequently disposed, if the patient is a child, to say to the parents that he will "grow out" of the defect. This is sometimes a mere evasion. At other times it is another example of a belief unwarranted by actual facts. I think one can safely say that there is no such thing as "growing out" of stuttering. The child may in after years get the mastery of his speech, but his recovery is not a mere incident of growth; it is the result rather of long and painful efforts at self-education. Many, alas, are never successful in this struggle. Some find the affliction increasing in severity as age advances.

This subject is of sufficient importance to deserve better treatment. It is with the view of helping toward a clearer understanding of it that I have asked to be heard.

One of the difficulties in the way of clear thinking on this subject seems to be a matter of nosology.

For the sake of simplicity it has seemed to me to be desirable to classify the forms of speech defects which arise from *organic* lesions and anomalies in the cortical centers of control under the term "aphasia." Under another heading (I prefer the term "stammering," since it conforms to the most extensive usage, especially in the German literature, and also since it supplies a name for an otherwise undesignated group) should be classed those abnormalities of *pronunciation* which arise (1) from lack of development, as for example in the baby talk of childhood, and (2) from malformations and traumatic interferences with the organs of articulation. Under the third heading should be classed another, a wholly different, type of defect which, I think, for reasons similar to those that are applied to the term "stammering," should be called "stuttering."

This group has the advantage of being based on the one principle of causation, and hence makes for clearness and simplicity. Under each heading there can be as many names or varieties as the conditions warrant. This classification will help us to avoid such confusions as those which arise, for instance, from Scripture's[1] use of the term "lisping" as coordinate with stuttering, whereas lisping should be classed as a variety of stammering. The same confusion, only worse confounded, exists in the attempts at classifying the varieties of stuttering, in certain cases, for example, on the basis of the letters in the alphabet which give difficulty to the speaker.

The etiology, general character and modes of handling aphasia are matters of common knowledge. Stammering as herein conceived is a comparatively simple matter and admits of easy handling, and, generally speaking, is not serious. In this connection, therefore, they will be omitted.

It is to the condition designated as "stuttering" that I desire to call attention in the present connection. Stuttering is to be differentiated from the two foregoing types of speech defects, (1) on the ground of its intermittent character, (2) by reason of the fact that it is not associated with organic lesions, and (3) by reason of the fact that it is conditioned on certain states of mind in the form of emotions, feelings, attitudes or ideas. The symptoms of stuttering are many and varied. They may be divided into three general headings: (1) physiologic, (2) psychophysical, and (3) mental.

Under the physiologic heading we find in the first place disturbances of breathing. The stutterer withholds inhalation beyond the point of the inception of speech. He often attempts to speak with empty lungs. Often when he tries to inhale before speaking he will exhale while struggling with an initial consonant before producing vocal sound. In other instances the natural rhythm of breathing is disrupted so that the pneumograms present irregular, jagged forms instead of regular waves. Breathing in these instances becomes spasmodic, and speech is in jerky blurts. I have found that in normal speech the approximate temporal relation between inhalation and exhalation is expressed by the ratio 217: 1,000, whereas with the stutterer the ratio is 535: 1,000. There are also changes in the relationship between the thoracic and the abdominal curves which are extreme. Ten Cate[2] seems to have found that whereas the rest breathing curves of the stutterer are like those of the normal person, the speech breathing curves are markedly different and are characterized by the fact that the thoracic and abdominal breathing curves are synchronous as contrasted with the anachronous curves of the normal speaker. In my own studies I have found nothing to confirm this opinion. In a few instances I found, as others (Gutzmann, for example) have found, an opposition of phase between costal and abdominal breathing, or the see-saw respiration, a condition which, Janet[3] finds, exists in certain forms of hysteria. No one condition, however, was found to be common to all or even to a large number of cases, and no single condition was found to be permanent in any one case. There is, therefore, nothing more than a general condition of asynergy in this process of the speech function. This asynergy naturally results in the loss of efficiency in vocalization. The subjects studied by me utilized 36.5 per cent. of the expiration interval in vocalization, whereas normal speaking shows a utilization of 95.5 per cent.

The second group of symptoms I have chosen to designate as psychophysical, by which is meant certain physiologic changes which are associated with, or conditioned on, alterations in mental states, changes which have to do with processes not directly related with the function of speech. These changes are also of three classes, namely, pulse rate, volumetric changes of the blood, and galvanic changes. The pulse rate is found to be markedly increased in the period of time during which the stutterer is anticipating the necessity of speaking, also during the act of speaking, and finally, if the speaking interval is short, for several seconds afterward. The average pulse rate for the first period in my investigations was 90.2; for the second period, 99.8, and for the third period, 98.6. The range of extreme variation of the first period was from 72 to 120, for the second period from 78 to 126, and for the third period from 72 to 129.

The plethysmograms show the familiar "attention drop," indicating an initial flow of the blood from the periphery at the point of inception of speech. Succeeding the initial point there is found in the majority of cases a rise in the curves indicating a reaction. In certain instances this rise was very pronounced, amounting in cases to as much as 5 cm. in thirty seconds. Very similar to the volumetric disturbances are the galvanic changes which have been indicated by a somewhat preliminary investigation of this subject. In this, as in all of the physiologic manifestations, there is found a rough correlation between the severity of the stuttering and the variations from the normal in the registrations of the functions.

It may be said, therefore, that the physiologic and the psychophysical symptoms lack the definiteness of correlation which would be necessary to give them pathognomonic value. Gutzmann of Berlin, who has done a great amount of work on the physiologic side of the matter, says that the symptomatology of stuttering is practically infinite. In spite of this, the treatment used by him is entirely physiologic. He therefore convicts himself of doctoring symptoms. The physiologic abnormalities may all be best described by such general terms as "incoordinations," "disturbances," "asynergies" and the like.

Let me here point out very briefly without critically examining, the main varieties of mental phenomena

1. Scripture, E. W.: Stuttering and Lisping.
2. Ten Cate, M. J.: Ueber die Untersuchung der Athmungsbewegung bei Sprachfehlern, Monatschr. f. Sprachheilkunde, 1902, xii, 247, 321.
3. Janet, Pierre M. F.: The Major Symptoms of Hysteria, p. 254.

that have been found to be connected, causally, it would seem, with the rise of stuttering.

First among the mental causes should be mentioned the emotions. Assuming the causal value of these mental states, all of the foregoing physiologic disturbances may be pointed to as evidences or expressions of them. To those who would demur to the psychologic interactionism implied in the foregoing suggestion, it is possible to offer many introspective evidences of emotions couched in terms used many times by the subjects themselves, such as "fear," "anxiety," "uneasiness," "distrust" of themselves, "lack of confidence," "dread" and the like.

Besides the more profound states of mind, there are many subtle feelings which we may designate as "attitudes," the presence of which will often determine the stutterer's ability to speak. Attitude toward others is markedly effective in giving rise to the abnormality. Stutterers are often able to speak perfectly to themselves when alone, to lower animals, to children and to the socially inferior, but are unable to speak normally to persons in authority over them or in any other way superior to themselves. (Would anatomic, organic or physiologic causes thus behave?)

Abnormalities of mental imagery have in recent years been cited as constituting the real seat of the difficulty. Bluemel[3] holds that stuttering is due to "transitory auditory amnesia." Swift[4] thinks that stuttering is "an absent or weak visualization at the time of speech."

Attention is one of the most positive influences in stuttering. Contrary to what is found in the case of nervous tics, attention concentrated on speaking exaggerates the abnormalities of movement, whereas distraction will serve to allay the difficulty. Most of the ancient remedies for stuttering have owed their efficiency to their capacity for distracting attention. This is doubtless true of the famous Dieffenbach[5] method of cutting a plug out of the back of the tongue.

Again, if the stutterer feels a sense of responsibility for speaking, or if he realizes the necessity under any situation to speak, especially if he sees that embarrassment will follow if he does not speak, he will become powerless to assume voluntary control of his speech organs.

Coupled with all of the more prominent and specifically definable states of mind, there are many variations of remote subconscious associations and organizations of memory complexes that constitute the psychic background of stuttering. Quite a number of the modern psychanalysts are of the opinion that emotional complexes due to the repression of sexual experiences in childhood produce psychic traumas which affect the function of speech so as to produce the abnormal inhibitions by which stuttering is characterized. This obviously makes it analogous to hysteria, if not identical with it.

Dr. Swift[4] reaches the conclusion that stuttering is to be referred to an abnormality vaguely localized in the "region of the personality." The specific nature of the abnormality, as he conceives it, I have referred to above. Dr. Elmer L. Kenyon[6] reached somewhat the same conclusion some years ago.

It has long been noted that one of the most important factors in the cause of stuttering, in children particularly, is imitation. So important, indeed, is this factor that I have concluded that it would be possible to assign this as the cause of most cases.

A good many recent writers on the subject have called attention to the fact that the diagnosis of this condition has passed through several distinct phases. The first stage considered that the seat of the malady was in the peripheral organs, the tongue being the chief offender. Gradually the seat of the difficulty has been shifted from the peripheral to the central region. The theories as to just what the nature of this mental involvement is are quite numerous, as can be seen by reference to the ideas cited above. There are theoretical and factual objections to many of the psychologic diagnoses that have been offered. But this is not the place to discuss the value of the individual theories. It is rather the purpose to point to the fact that the almost unanimous verdict, even of medical opinion, traces the defect to causes that lie essentially in the mental realm. In spite of this fact, however, physicians all over the country seem inclined to assume the responsibility for its treatment. Dr. Kenyon,[6] although he says the public schools of the country should take care of the training of these defectives, yet asserts that "the future of the stammerer rests very largely on the interest or apathy of the medical profession in his problem." Dr. G. Hudson Makuen[7] says, "The stammerer must be taught to speak in somewhat the same way as a person is taught to play on the violin or the piano."

There is no essential structural or organic condition demanding medical attention in the case of the stutterer, any more, at any rate, than there is in the case of the musician. There seems to be no valid reason, therefore, why one should be turned over to the physician and the other to the educator. Two conclusions seem inevitable, first, that stuttering is a mental defect and, second, that the treatment of it should be primarily educational rather than medical. Both the physician and the psychologist of the present day are having more problems thrust on them than they can solve, and neither is anxious to assume new burdens. Yet, in the interest of suffering humanity it seems to me to be time for the two sciences to come to an understanding regarding the matter. Laying aside the matter of scientific and professional jurisdiction, it should be emphasized that this problem is too big to be handled by the side-line practice of the physician. In this country we not only have no public conscience, but we have not even an intelligent professional opinion on the subject. Woe betide the man who sells us impure drugs or foods, but in this realm of human needs unmolested frauds are preying on afflicted humanity. As compared with what the European countries have done in the case, we in America are merely trifling with it. In view of the gravity of the condition and in view of the numbers afflicted, such trifling is not only not creditable but also is criminal.

3. Bluemel, C. S.: Stammering and Cognate Defects of Speech, i, 187.
4. Swift, Walter B.: A Psychological Analysis of Stuttering, Jour. Abnormal Psychol., x, No. 4, p. 225.
5. Dieffenbach, J. F.: Die Heilung des Stotterns durch eine neue chirurgische Operation, Berlin, 1841, 35 pp.
6. Kenyon, Elmer L.: Pennsylvania Med. Jour., December, 1909.
7. Makuen, G. H.: Lit. Dig., March 12, 1910.

Thankfulness for Health.—Men that look no further than their outsides think health an appurtenance unto life, and quarrel with their constitutions for being sick; but I that have examined the parts of man, and know on what tender filaments that fabric hangs, do wonder that we are not always so; and considering the thousand doors that lead to death, do thank my God that we can die but once.—Browne.

CRANIOPHARYNGEAL DUCT TUMORS*

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Tumors arising from rests of embryonic tissue along the course of the craniopharyngeal duct have not received adequate or proper recognition, although they represent the most common type of heteroplastic tumor of the hypophysial region. Only three authentic cases of this type of growth in which the genesis of the tumor was recognized have been reported in this country; one is reported by Lewis,[1] and two by Cushing.[2] I report one case herewith, and have found thirty-seven undoubted cases in the literature, many of which have been reported under other titles than the foregoing.[3] With a better knowledge of this type of neoplasm, many cases should be recognized that now are diagnosticated as epithelial tumor of the infundibulum and third ventricle, papilloma of the choroid plexus, cystic endothelioma of the pia, epithelioma of the malpighian type, adenoma, adenosarcoma of the hypophysis, dermoid and cholesteatoma.

HISTORY

Erdheim[4] was the first to distinguish between tumors arising from craniopharyngeal duct inclusions and other neoplasms of the hypophysis. While working on the fat content of the hypophysis, in one of fifty normal hypophyses, he discovered a cyst 4 mm. in diameter resting on the anterior lobe in the median line in the region of the infundibulum. The cyst wall, microscopically, showed nests of stratified epithelial cells lying in an embryonic connective tissue stroma. These nests were limited externally by a single layer of cylindric cells that resembled closely the basal layer of the buccal mucosa; beneath this layer were many layers of fusiform cells that by Haidenhain's iron-hematoxylin stain were seen to have intercellular bridges; in fact, they resembled closely the prickle cells of the stratum spinosum of the buccal mucosa. Keratohyalin and cornification were absent, as were also hair follicles, sweat and sebaceous glands. Some cells were undergoing hydropic degeneration. Erdheim here remarks that no one had ever before found stratified squamous epithelium on the hypophysial gland, although careful histologic examinations had been made by Saint Remy, Schönemann, de Coulon, Benda and Thom.

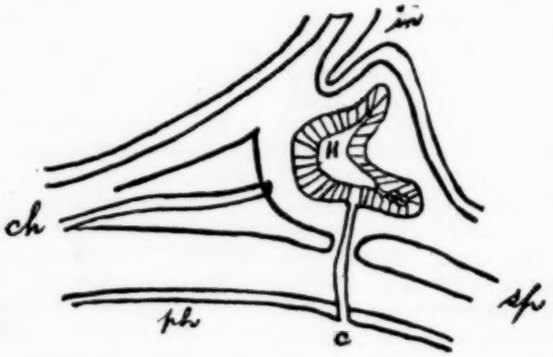

Fig. 1.—Development of the hypophysis in the embryo rabbit (after Mihalkovics): *in*, infundibulum; *H*, anterior lobe of hypophysis; *c*, craniopharyngeal canal; *sp*, sphenoid; *ph*, pharynx; *ch*, chorda.

The finding of undifferentiated buccal epithelium near the anterior lobe of the hypophysis led Erdheim to believe that they were inclusions or rests of the craniopharyngeal duct, and that they might commonly be found if careful search were made for them. Indeed, on careful examination of thirteen suitable fetuses, he discovered that ten of them, or over 80 per cent., showed remains of buccal epithelium in the infundibular region. He then looked over the tumors of the hypophysis that had been preserved in the pathologic museum of Vienna, and found seven that unmistakably were duct tumors. He also collected sixteen cases from the literature that had been reported under various other titles.

EMBRYOLOGY

Rathke in 1838 first showed that the anterior lobe of the hypophysis originated in a pouch of epithelium from the primitive foregut. The craniopharyngeal duct, about the fifth week of embryonic life, begins to traverse the sphenoidal space to reach the cranial cavity, where its extremity fuses with the posterior lobe and infundibulum, which grow down from the telencephalon to form the hypophysis. This craniopharyngeal canal usually disappears before birth; in certain instances, it may remain in the sphenoidal bone; in one instance, Suchanek found the hypophysis here, and Erdheim, in a case of acromegaly, found a normal hypophysis in the sella and a malignant adenoma in this canal.

A group of cells remains also at the inferior extremity of the canal between the mucosa of the roof of the pharynx and the bone to form the pharyngeal hypophysis.[5] Rests of buccal epithelium are also found within the persistent canal and at the cranial extremity of this canal in the region of the infundibulum and anterior lobe of hypophysis, and may later give rise to cystic or solid tumors, affording an excellent example of the Cohnheim-Ribbert theory of the origin of tumors. Analogous to the ectopic cysts arising from the hypophysial duct are those cysts which arise from the thyroglossal duct. Inclusions of mouth epithelium also occur in the jaw and give rise to polycystic adamantinomas; their histologic characteristics plainly resemble those of the hypophysis duct cysts. It may be predicted that some tumors will be found in the pharynx that have their origin in the pharyngeal hypophysis. I have found no such report in the literature to date.

PATHOLOGY

The gross characteristics of hypophysis duct tumors are typical and easily differentiated from other tumors of this region. They are always in the median line at the base of the brain, bounded anteriorly by the optic chiasmus, posteriorly by the pons, above by the floor of the third ventricle, and below by the sella. Laterally they may encroach on the cerebral peduncles and temporal lobes. The circle of Willis usually surrounds

* Owing to lack of space, this article has been abbreviated in THE JOURNAL by omission of a large table which is a compilation of all the cases in the literature. The complete article appears in the reprints, a copy of which will be sent by the author on request.

1. Lewis, Dean D.: A Contribution to the Subject of Tumors of the Hypophysis, THE JOURNAL A. M. A., Sept. 17, 1910, p. 1007.
2. Cushing, Harvey: Disorders of the Hypophysis, 1912.
3. Boyces and Beadles: Jour. f. Path. u. Bacteriol., 1893, i, report five cases of cystic tumors of the hypophysial region, some of which may have developed from inclusions of the hypophysiopharyngeal duct. They cannot be included as undoubted cases, however, as there is no record of a microscopic examination. Erdheim also mentions a case of Ilmoni's, which also must be included as a doubtful case.
4. Erdheim: Ueber Hypophysenganggeschwülste und Cholesteatom, Sitzungsber. d. k. Akad. d. Wissensch., 1904.
5. Haberfeld: Die Rachendach Hypophysis, Beiter. z. path. Anat. u. z. allg. Path., 1909, xlvi.

the tumor. The hypophysis itself may be found intact or be pressed against the floor of the sella. The infundibulum usually affords the starting point for the tumor. The first five cranial nerves may early undergo a pressure atrophy, but the olfactory nerves usually escape. The foramen of Monro may be occluded, and internal hydrocephalus may result. The optic tracts are most seriously affected, and may be spread out on the tumor like a ribbon. The sella is usually normal in size or only slightly enlarged. The tumors are usually the size of a pigeon's or hen's egg when discovered, but one case is reported the size of a human fist. The majority are cystic; when solid, they show areas of cystic degeneration. The cysts contain serous, mucoid or hemorrhagic fluid in which cholesterin crystals are sometimes seen. The inner surface of the cyst often shows papillary excrescences.

Histologically, one sees in the cyst wall an embryonic connective tissue stroma rich in nuclei and blood vessels and undergoing hydropic degeneration with the production of pseudocysts. In the stroma lie masses of epithelial cells sharply demarcated by a deeply staining layer of high cylindrical cells (basal cells) below which are many layers of ovoid or fusiform cells with lightly staining nuclei (prickle cells). By proper technic, intercellular bridges can be seen. Keratohyalin and cornification are absent, differentiating them from epidermoids and cholesteatomas. No adult hypophysis cells are present. Masses of epithelial cells are frequently encountered which have become necrotic and infiltrated with calcium salts. Hydropic degeneration is common, leading to cyst formation. In Erdheim's seven cases a malignant change to carcinoma was noticed in four, the metastases being always local. The solid tumors have a papillary arrangement of their epithelium.

Fig. 2.—Photomicrograph of a portion of wall of cyst developing from an inclusion of the craniopharyngeal duct. Note the limiting layer of high cylindric cells and the areas of cystic degeneration.

ETIOLOGY AND SYMPTOMATOLOGY

From a study of thirty-eight cases in the literature, 33 per cent. occur under 20 years of age, 42 per cent. between 20 and 40 years, and 25 per cent. over 40 years. As to sex, they are about equally divided. Of seventeen in which the symptoms were clearly stated, twelve, or over 70 per cent., were associated with adiposity and other symptoms of the Frölich syndrome, such as genital dystrophy and loss of body hair. In twenty-six cases, nineteen had symptoms of failing vision and fifteen of brain pressure, such as headaches, vomiting, dizziness, choked disk, bradycardia, epileptiform seizures and pareses. Optic atrophy was noted in seventeen cases, choked disk in two cases. The clinical course is varied; some cases reach the acute stage in three or four weeks, while others admit symptoms lasting over a period of years.

As to the cause of adiposity and genital dystrophy, Erdheim and Bartels believe that the growing tumor interferes with certain centers at the base of the brain outside the hypophysis. Lewis suggests the pars intermedia as an etiologic factor, and further states that deposition of fat may in many cases be brought on by the sedentary habits which result from loss of vision and apathy attendant on increased intracranial pressure.

Cushing[6] has indicated that hypopituitarism is the cause of dystrophia adiposogenitalis. No case reported has been associated with acromegaly.

Creutzfeldt's[7] table of fifty-five cases of tumors of the hypophysis without acromegaly which came to necropsy showed 35 per cent. which were hypophysiopharyngeal duct tumors.

DIAGNOSIS, PROGNOSIS AND TREATMENT

The sella is rarely enlarged, and roentgenoscopy will usually be negative. The early disturbance of vision and one or more symptoms of the Frölich syndrome, especially adiposity, will suggest a tumor of the hypophysial region; 70 per cent. of these are craniopharyngeal duct tumors. The finding of a cyst at operation with the microscopic demonstration of stratified epithelium of the buccal type completes the diagnosis. Epidermoids and cholesteatomas contain keratohyalin and cornification. The acromegalic shows a hyperplasia or adenoma of the anterior lobe of the hypophysis. The fetal tissues of a teratoma, the radiating mantlelike arrangement of cells of the perithelioma, and the glial and ependymal cells of the glioma and ependymal tumors should not confuse the pathologist. Tumors of the pars intermedia are rare, and resemble thyroid tissue histologically.

If drainage of the cystic type can be maintained or the accumulation of fluid prevented by other means, the patient can live for an indefinite length of time. If the cyst continues to enlarge, blindness usually results from pressure on the optic tracts or chiasm, and death follows in a few months or years from brain pressure. The outlook, on the whole, for this type of tumor, is decidedly gloomy, as it is practically impossible to separate the cyst wall from the surrounding brain structures.

6. Cushing: The Functions of the Pituitary Body, Am. Jour. Med. Sc., 1910, cxxxix, 473.

7. Creutzfeldt: Ein Beitrag zur normalen und pathologischen Anatomie der Hypophysis cerebri des Menschen, Jahrb. d. Hamburger Staatskrankenanstalten, 1909, xiii, 273.

The active treatment as yet is unsatisfactory. It is surgical and consists in the puncture and drainage of the cyst by a transsphenoidal route (Kanavel). These cysts usually cease draining and produce pressure symptoms and blindness after weeks or months. It seems impossible to eradicate all of the cyst wall, although an attempt should be made to cut away as much as one can without injury to the surrounding parts. Lately, the injection of the extract of the posterior lobe of the hypophysis has been used, the idea being to absorb the contents of the cyst. Some clinicians report good results by this method, although, theoretically, it is difficult to account for such improvement.

REPORT OF CASE

R. B., man, aged 18, a patient of Dr. Kanavel, to whom I am indebted for the specimen, states that six weeks before entrance to the hospital he began to suffer with frontal headaches of a deep, throbbing character, and with failure of vision. He had no frequency of urination and was not drowsy. An examination revealed no change in the sense of smell or taste. The pupils were dilated and equal. The thyroid was not increased in size; there was no hair on the chest or in the axillae, and there was a light growth of pubic hair. There was no adiposity. The past history was uneventful except for measles and mumps when the patient was a child. Dr. Kanavel diagnosticated, clinically, a pituitary cyst, and an operation was performed by the transsphenoidal route, the nose being reflected upward. The cyst was opened, and 3 drams of a chocolate colored fluid were removed. The sella was found somewhat enlarged. After operation, the headaches were relieved and vision returned, and the patient made a good recovery. Two months later the headaches returned, and vision again failed him. Now there was dizziness and vomiting in addition to the other symptoms.

A second operation similar to the first was performed and relief again obtained. After an interval of six months, the headaches returned with still greater severity, and affected the frontal and temporal regions. The vision almost entirely failed, and an examination of the eyegrounds revealed an atrophy of the optic nerves. There was projectile vomiting.

A third operation was performed by Dr. Kanavel, and half an inch of the anterior wall of the cyst was removed, together with some blood stained fluid. The patient's symptoms were again relieved, and he subsequently received some injections of pituitary extract. The patient is still living, one and a half years after the last operation, and there has been no return of symptoms to date.

Microscopic examination of a portion of the cyst wall stained with hematoxylin and eosin reveals an embryonic connective tissue stroma in which lie masses of stratified epithelium undergoing hydropic degeneration. The masses of epithelium are bounded by a layer of high cylindric cells whose nuclei stain deeply. They resemble the basal cells of the buccal mucosa. Underneath this layer are several layers of fusiform cells whose nuclei stain less deeply. While no special stain was made at the time, these cells resemble the cells of the stratum spinosum. Keratohyalin and cornification were absent. Hypophysis cells were not seen.

The diagnosis is: a benign cystic tumor of stratified squamous epithelium originating in an inclusion of the craniopharyngeal duct.

CONCLUSIONS

1. Most cystic and solid tumors originating from the region of the infundibulum and anterior lobe of the hypophysis grow from embryonic rests of buccal ectoderm from the craniopharyngeal duct.
2. They are the most common type of intracranial tumor associated with the Frölich syndrome.
3. Eye changes occur early. Symptoms of acromegaly are absent.

Requisites for Health.—Be sober and temperate, and you will be healthy.—Benjamin Franklin.

AN EXTRAORDINARY POLYMORPHONUCLEAR LEUKOPENIA IN TYPHOID FEVER*

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AND
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This case is reported because of the most unusual degree of polymorphonuclear leukopenia which occurred during the third week of typhoid fever.

The patient, J. S., man, aged 19, was admitted, Sept. 26, 1915, to the service of Dr. Alfred Stengel, University Hospital. He complained of weakness, headache, diarrhea, and fever of gradual onset about September 12, persisting with varying intensity up to admission. Physical examination showed an emaciated young adult male, evidently toxic and heavily infected. The pulse was dichrotic; the posterior cervical, epitrochlear and inguinal lymph nodes were slightly enlarged; the spleen was not palpable on admission, but became so three days later; the abdomen was moderately distended and exhibited a few characteristic rose-spots; the thorax was negative except for the evidences of a mild acute bronchitis. The temperature ranged in the first twenty-four hours from 103.8 to 99.4 F., the pulse from 120 to 96, and the respirations from 28 to 24. The Widal reaction taken on the day of admission (considered the seventeenth day of the disease) was strongly positive. A second Widal reaction four days later was the same. Blood culture was sterile, but a culture of the urine yielded *Bacillus typhosus*. The Wassermann reaction was negative.

TABLE 1.—BLOOD COUNT

Day of Disease	W. B. C.	Poly.		Lymph.		L. M.	T.	E.	B.
		Rel.	Abs.	Rel.	Abs.				
17	7,600	0.5	38	98	7,448	1	0.25	0	0.25
20	5,400	1.5	81	94.5	5,103	3	1	0	0
23	11,900	33	3,927	58	6,902	4	5	0	0
24	12,000	58	6,960	41	4,920	1	0	0	0
25	8,400	58	4,872	39	3,276	2	1	0	0

TABLE 2.—ARNETH COUNT

	Nuclear Divisions				
	1	2	3	4	5
J. S., twenty-fourth day	48	38	10	4	0
Normal	5	35	41	17	2

The unusual leukocytic picture observed is shown in Table 1.

There was, therefore, present on admission and for a few days thereafter, a most extraordinary reduction in the number of the polymorphonuclear neutrophils. Less striking, but still pronounced, was the increase of the lymphocytes. In character, about one half of the latter were the typical small lymphocytes, the remainder were somewhat larger with paler nuclei and were of the type described as mesolymphocytes. Eosinophils were absent as usual in typhoid fever. One week later, the absolute polymorphonuclear count had returned approximately to normal. An Arneth count on the twenty-fourth day, contrasted with the normal Arneth count, is shown in Table 2, and indicates clearly the great predominance of young forms at this period. We must conclude, therefore, that the previous reduction of the polymorphonuclears was the result of a destruction of these cells and not of their mere withdrawal from the peripheral circulation.

On the twenty-fourth day, a persistence of the lymphocytosis gave an abnormally high total leukocyte count. During the further course of the case, which was one of uncom-

* From the Medical Wards of the University Hospital.

plicated typhoid fever, the total leukocytes varied from 6,100 to 15,900; the polymorphonuclears ranged from 44 to 68 per cent., and the lymphocytes from 28 to 55 per cent. The temperature remained approximately normal after the fifty-first day.

The possibility of the condition being one of aleukemic lymphatic leukemia received due consideration. The generalized enlargement of the lymph nodes was extremely trifling, but Pappenheim has reported two cases of lymphatic leukemia without enlargement of the lymph nodes, in one of which there were found in the blood 20,000 leukocytes per cubic centimeter, of which 96 per cent. were small lymphocytes. The character of the leukocytes found, the absence of any associated changes in the erythrocytes, however, and the further course of the case made the diagnosis of leukemia untenable.

An investigation was made to discover any drug or toxic substance to which the patient might have been subjected before admission and which might have been responsible for the destruction of the polymorphonuclears, but it was fruitless. It seems proper, therefore, to regard the blood picture in this case as an extreme exaggeration of the tendency characteristic of the blood in typhoid fever, namely, a diminution in the polymorphonuclear neutrophils to a minimum about the time of defervescence, a gradual increase in the lymphocytes persisting somewhat longer than does the diminution in the polymorphonuclears, and an absence of eosinophils during the febrile period. These alterations in the blood picture in typhoid fever have been noted in the extensive studies of Türk,[1] of Naegeli[2] and of Thayer.[3] The reduction of the polymorphonuclears to such a degree as in this case, however, has not previously been reported in typhoid fever, so far as we are aware. Naegeli mentions a boy with typhoid fever with an absolute polymorphonuclear count of 900, and Thayer notes a polymorphonuclear percental count of 24.6 as the lowest observed in studying 832 cases. Of leukopenias occurring in other diseases, there are three cases in the literature of a grade comparable with ours. Vacquez and Ribierre[4] reported the case of a young man with extensive tuberculosis of the mediastinal and peribronchial lymph nodes who exhibited shortly before death a leukocyte count of 2,300, of which 8 per cent., or 184 cells, were polymorphonuclear neutrophils. Brown[5] reported the case of a young woman with staphylococcic septicemia who, six days before death, had a leukocyte count of 1,000 with only 1 per cent. of polymorphonuclears. Türk's[6] was likewise one of staphylococcic septicemia in a young woman who three days before death had a leukocyte count of 940 with no polymorphonuclear neutrophils in 532 cells examined. Two days later, the leukocytes were 1,950, of which 0.28 per cent. were polymorphonuclear leukocytes. At necropsy in this case, the bone marrow showed complete loss of the leukocytogenic series of cells, although the erythropoiesis appeared normal.

All three of these cases differ, however, from ours in that they were in an agonal state, and the reduction of the polymorphonuclears was, in the last case at least, associated with a degree of injury to the bone marrow which can scarcely have existed in our case in view of the rapid subsequent rise of the polymorphonuclear count to normal or, indeed, above normal.

We are inclined to regard the case, therefore, as merely an extreme exaggeration of the characteristic blood change in typhoid fever, the mechanism of which is still unknown.

1. Türk, W.: Klinische Untersuchungen über das Verhalten des Blutes bei acuten Infectionskrankheiten, Vienna and Leipzig, 1898.
2. Naegeli, O.: Die Leucocyten beim Typhus abdominalis, Deutsch. Arch. f. klin. Med., 1900, lxvii, 279.
3. Thayer, W.: Observations on the Blood in Typhoid Fever, Johns Hopkins Hosp. Rep., 1900, viii, 487.
4. Vacquez and Ribierre: Lymphocythémies leucémiques et aleucémiques, Bull. et mém. Soc. méd. d hôp. de Paris, 1900, Series 3, xvii, 914.
5. Brown, P. K.: Fatal Case of Acute Primary Infectious Pharyngitis with Extreme Leukopenia, Am. Med., 1902, iii, 649.
6. Türk, W.: Septische Erkrankungen bei Verkümmerung des Granulozytensystems, Wien. klin. Wchnschr., 1907, xx, 157.

NUMEROUS WAR INJURIES REQUIRING PLASTIC AND GRAFTING OPERATIONS

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The following case is so interesting as to warrant reporting. How the soldier survived his injuries is a marvel to us all.

History.—G. B., aged 38, wounded Sept. 25, 1915, at Massige, received the first dressing ten hours afterward, with one antitetanic injection, and was admitted to the Hospital at Passy, September 29, under the care of Medical Chief Joseph M. Flint.

Examination.—The wounds comprised:

1. Wound at the level of the eleventh rib in the midscapular line.

2. Wound in the face (Fig. 1) involving the right half of the lower mandible, where there was a defect of at least an inch in the bone which had been blown away, the whole lower part of the cheek and right half of mouth, which involved both upper and lower lips, and tip of nose and right ala. This wound was infected with maggots, and was indescribably foul.

3. Shell wounds on the buttocks which were superficial and suppurating.

4. Shell wound just below right clavicle, with partial paralysis of right arm. Pulse was present on that side.

5. Wound of right great toe.

6. Simple Pott's fracture of both bones of the right leg, apparently involving the ankle joint, probably obtained by falling.

Treatment and Course.—The fractured leg was put up in a Cabot splint. October 28, a plaster cast was applied. Consolidation was progressing nicely.

The mouth wound was cleaned on the patient's reception with hot saline solution, hydrogen peroxid and solution permanganate 1:2,000. A piece of the lower jaw bone which was hanging solely by the mucous membrane was removed. Constant irrigation was used to help clean up the infection.

The remaining wounds healed kindly under antiseptic dressings.

Figure 1 represents the condition of the face on the patient's reception. The wound was insufferably foul, and there was a constant dribbling of saliva.

Figure 2 represents the condition, October 15, three weeks later. The rapidity of the reparative process was remarkable when one considers the number of other wounds the patient had.

Figure 3 represents the condition as it appeared six weeks after the injury. Up to this time the patient had been under the skilful care of Prof. J. M. Flint of New Haven, my immediate predecessor in the position of médecin chef of the hospital. November 17, I assumed charge, and this patient then came into my hands. November 29, a sequestrum was

removed from inside the mouth, which was loose. This was about one-fourth inch square.

Operation on the Face.—Dec. 10, 1915, I undertook a plastic operation on the face with the object of improving the disfigurement, and with the additional object also of loosening up the fragments of the lower jaw, so that they could be replaced in their proper relations with the upper teeth. It was seen that the larger left fragment was drawn over by the contraction of the scar tissue far to the right, and the lower teeth of that fragment were also posterior to the upper teeth, with the result that there was no occlusion whatsoever of the two sets of teeth.

Fig. 1.—Wound of the face, on admittance of patient.

After proper alinement of the lower teeth should be obtained, I purposed wiring the lower jaw fragment to the upper teeth, so that the defect should be fully maintained until the healing of the soft parts should be completed, when I purposed grafting in a piece of bone taken from the tibia to fill up the defect in the bone. This grafting could not be done, however, until all the process of necrosis of the bone should be fully completed.

By December 10, the cicatrization of the soft parts was complete, so I operated on the man under intranasal ether anesthesia. The vertical scar in the lower lip was split open, into the mouth, and the left larger fragment of the lower jaw was wedged over to the left, bringing its teeth in exact apposition with the teeth of the upper jaw. Dental wire was inserted about the bases of the four upper teeth, and these were twisted together. A similar wire was inserted about the bases of four of the lower teeth and twisted. The two wires, one from the upper and the other from the lower jaw, were then twisted together. The proper occlusion of the teeth was then perfect.

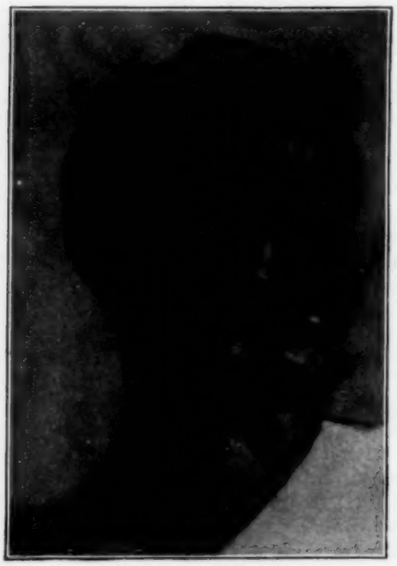

Fig. 2.—Three weeks later.

Figure 4 is a rough drawing of the plastic operation performed on the soft parts. In this operation, the objects to be accomplished were, first, to close the defect in the upper lip, second, to increase the width of the mouth, in the transverse diameter, and, third, to overcome the deforming drawing in of the edges and bottom of the scar in the lower lip and chin. The first procedure was to split the entire scar from nose to chin and to free its edges. There was seen to be too much tension to bring the edges together without tension, so a rectangular flap, *B*, was carried out in the cheek for 2 inches, consisting of skin and subcutaneous fat, but not going through the mucous membrane of the mouth. The internal edge of *B* was sutured to *D* by interrupted sutures of black silk. The edges of *A* were brought forward, after dissecting them up sufficiently, and their edges were sutured to the edges of the skin of the upper and lower lips for an extent of half an inch. This is clearly seen in Figure 5. By this means the mouth was transversely increased by half an inch. The scar on the chin was excised and the depression removed, which was then followed by accurate suturing of the edges by interrupted black silk.

The nose was a difficult proposition. The scar was split and the projection (Fig. 2) of the cartilage above the scar was removed by cutting it away as much as possible. This was followed by suturing the edges of the scar. Doubtless later on it may be advisable to insert a piece of a rib with its periosteum into the tip of the nose upward through the scar, so as to elevate the lowermost portion of the nose, which is somewhat depressed. This, however, will be purely for cosmetic purposes. At present the patient is so well satisfied with his appearance that he refuses to consider any further grafting operation designed to improve the appearance of his nose.

The results of this operation, which were most gratifying, are seen in Figure 5. Union was by first intention throughout. The wires maintained the teeth in perfect apposition and occlusion.

December 20, because of loosening of the wires about the teeth, these were replaced. Several small pieces of bone came away through the mouth subsequently. Jan. 19, 1916, it was deemed a suitable time to perform the grafting, since the wound in the mouth had healed perfectly and there was no dead bone to be detected anywhere. Intranasal ether anesthesia was administered. A transverse incision was carried along the lower border of the lower jaw across the defect in the bone. Great care was exercised in avoiding opening into the mouth at any stage of the operation. The ends of the fragments were first exposed and laid bare, and with the periosteal elevator, half an inch of their vertical diameters was also laid bare. The furrow between these fragments was then carried cautiously deeper until depth enough was obtained to inlay the graft. The upper right tibia was cleaned with iodin, and the upper internal surface was exposed. The graft to be obtained was then accurately measured on the posterior aspect of this surface, as one should avoid taking the tibial crest for a graft, since the crest is the strongest portion of the tibia, and the removal of a portion of this may so weaken the bone that a fracture will subsequently occur, as happened in two of my previous cases. Since then I have

Fig. 3.—Six weeks after admittance of patient.

always avoided taking a graft from the tibial crest in consequence.

Since I had at my disposal no motor saw, the graft had to be removed with a chisel, which ordinarily acts well enough; but in this case it resulted in fracturing the graft longitudinally into two pieces. The medullary cavity was opened in taking the graft. The ends of the two fragments were notched with the chisel to receive the graft, and two holes were drilled in each fragment, and two in the graft ends. Unfortunately, at one stage, the drill accidentally escaped from the bone and went much deeper into the soft parts than was intended, although it was not appreciated at the time that the mouth had been penetrated. Had this been positively ascertained, I should not have inserted the graft at this time, since infection from the mouth is almost certain to result in the death of the graft. This I have learned in two of the five graftings that I have done for defects of the lower jaw, in which infection from the mouth occurred with the resultant deaths of the grafts.

Fig. 4.—Diagram of plastic operation.

In taking the grafts it is well to go into the medullary cavity, since in this way endosteum is retained on the graft. The periosteum had previously been marked out larger than the graft itself and the whole transverse extent of the periosteum was removed from the internal tibial surface, to the posterior part of which was attached the bone graft itself. In this way there are two bone producing structures left attached to the graft, namely, the periosteum and the endosteum, the former of which is well known to be the more important osteogenetic structure.

The graft was fastened in place by chromic sutures through the drill holes, the periosteal surface being external. Lane's technic was carried out carefully throughout, and neither the graft itself nor any part of any instrument coming in contact with the tissues was ever touched by the gloved hand. This I consider very important in avoiding infection. The graft measured 1½ inches long and ½ inch wide and ¼ inch thick.

At this date, one week after the operation, the wound has a foul, mouth discharge so that I now think that the drill entered the mouth when it slipped, thus infecting the graft.

Fig. 5.—Result of operation.

I presume that the graft will die and will have to be removed. This, however, will not militate against the final result, for another graft when the wound has finally perfectly healed will be inserted, and if the mouth has not been entered, will eventuate in a perfect union of the graft with the ends of the fragments. In the meantime the defect will be maintained by frequent wiring of the teeth in their proper occlusion. One should not be discouraged at such a result, for the vicinity of the mouth is a difficult place to insert a graft, because of its liability to infection. One can insert a graft as many times as one has patience to do it until a successful result is obtained.

The length of time which I have thought best to maintain immobilization of the lower jaw to the upper, whether held by wires as in this case, or by splints, as I have done in several of my previous cases, has usually been from three to four months. At the American Ambulance Hospital in Paris where a number of these grafting cases has been done, I was told that six weeks was the usual time for which they maintained this immobilization. In several cases, however, they have had to resort to additional times of immobilization. Certainly a graft is slow in developing, and perfect immobilization is essential to the success of a graft for a longer time than is necessary in a simple fracture.

An interesting feature of this patient's four wounds, of the nose, cheek, upper front chest and posterior lower chest, is that on roentgenoscopic examination it was found that no bullet or piece of shell remained in the tissues. Since these four wounds are all on an exact line, it was surmised that the same bullet or piece of shell was the author of all these four wounds.

The course of the bullet was: from the nose to the cheek and lower jaw, where it had its exit; then it entered again just below the clavicle, and penetrated through the axilla, where it injured the brachial plexus, finally making its exit beneath the middle of the scapula behind; or its course may have been in the opposite direction from a ricocheted bullet.

The injury to the brachial plexus was apparently not a total division of any of its branches, for all the movements of the hand and wrist can be done, though not to the full strength. There is a slight wrist drop and ulnar deviation of the hand with loss of radial abduction, showing a paralysis of the flexor carpi radialis. Flexion and extension of the fingers is voluntarily performed, though to a weak extent. The interossei act, since the fingers can be abducted and adducted. No operation has been deemed advisable on the brachial plexus.

Château de Passy, Jan. 30, 1916.

Factors Increasing "Expectancy of Life."—It is becoming evident that the prevention of the premature death of infants and the elimination of infectious diseases is only a part of the task of community hygiene. The increase in the adult death rate from certain types of organic disease, which has occurred during the last few decades, may not be readily explained, but it is none the less a fact not to be ignored. In the United States this increase is apparently more marked than in most European countries, and has had for one of its consequences a definite increase in the death rate of those age groups of the population from 40 years upward. Causes have been at work in the last thirty years which have increased disproportionately the mortality among American citizens of middle life. To what extent this is due to later survival of the inherently weak, to intemperate strenuousness in work and play, to the relatively sudden assumption of a sedentary life by large sections of the population, to the increased consumption of alcohol, to the presence of injurious substances in prepared foods or to what combination of all these and other factors has not been determined.—Jordan.

MULTIPLE URETERS WITH HYDRONEPHROSIS *

ALEXANDER HAMILTON PEACOCK, M.D.
SEATTLE

History.—This anatomic anomaly occurred in A. S., a boy, aged 9 months. The father, aged 29, of English descent, and the mother aged 22, of Scandinavian descent, were apparently normal and enjoyed good health. The mother had one other child, a boy aged 5 years. She had one miscarriage at 7 months, and several self-induced abortions. As far as could be traced there were no anatomic anomalies in the parents or their parents' families. The birth of this child was normal; he was early put on a feeding of sweet condensed milk, because of insufficient breast feeding.

His weight advanced steadily until the sixth month, and he seemed well in every way with the possible exception that he never urinated freely. After the sixth month he began to lose weight, became fretful and his health declined gradually with a slight but steady loss in weight, dropping from 24 pounds at 6 months, to 11 pounds just before death. A pediatrist was engaged and a milk formula was prescribed; the child's intestinal tract was thoroughly looked after, and gastric lavages, colon irrigations and frequent changing of the milk formula were without avail, as the child's abdomen continued to distend, feeling hard and tender to the touch. The mother noticed that the urine was white and looked like milk, smelling offensive and staining yellow. The last few days before death the baby refused all nourishment, convulsions set in and he died in a few hours.

Fig. 1.—Gross specimen.

Necropsy.—The child was seen after all respiration had ceased; the lungs were clean, the abdomen distended and solid on percussion. A necropsy was made ten hours after death. The heart, lungs, spleen, liver and intestines were normal. The appendix was of small caliber, somewhat elongated, and lay across one of the distended right ureters. The bladder was distended, egg shaped and measured 4 by 6 cm. The retained urine was milky, with a specific gravity of 1.015, and albumin was present; the microscope revealed many pus cells, epithelium, a few colon bacilli and staphylococci. There were four ureters.

URETER MEASUREMENTS

Ureters	Length cm.	Maximum Diameter cm.	Maximum Circumference cm.
A	22	7	25
B	20	4	10
C	16	1	2
D	15	4	11

The Ureters: A was enormously distended with a pyuria; the kidney pelvis was large; the ureter was tortuous, and opened into the bladder about one-third diameter from the prostate.

Ureter B was also greatly dilated and tortuous, had its own pelvis, and drained the upper pole of the right kidney. It descended behind the bladder, was attached for almost the entire diameter of the bladder, and had a large opening in the vesicoprostatic urethra.

Ureter C was a small rudimentary tube, a little larger than the normal adult ureter. It arose in the upper pole of the left kidney, and was firmly attached, in its lower two thirds, to Ureter D. It ran into the fundus of the bladder wall a short distance to become a blind pouch.

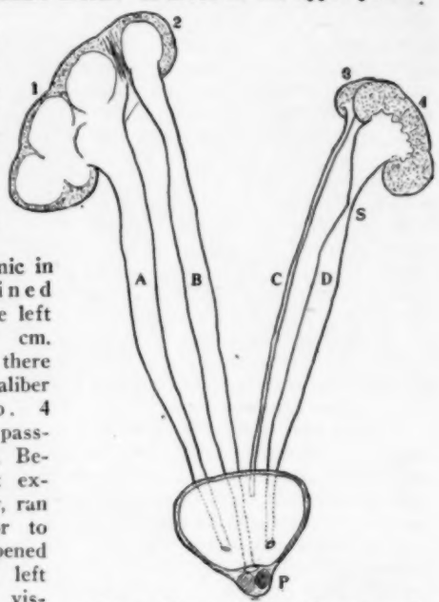

Fig. 2.—Key to drawing of gross specimen: Ureters: *A*, right major; *B*, right minor; *C*, left minor; *D*, left major. Kidneys: 1, right major; 2, right minor; 3, left minor; 4, left major. *S*, stricture; *P*, prostate.

Ureter D, colonic in appearance, drained nine tenths of the left kidney. Four cm. from the hilum, there was a small caliber stricture, a No. 4 ureteral catheter passing with difficulty. Below this point it expanded generously, ran normally posterior to the bladder, and opened into the lower left quadrant of that viscus. All of the ureter outlets were large and showed no signs of stricture or obstruction.

The kidneys also were interesting. The right one measured in length 13 cm., maximum diameter 8 cm., and maximum circumference 22 cm. It had a typical lobulated interior due to back pressure, the thin cortex showing normal kidney tissue. The upper pole was completely shut off from the main body of the organ by a dense portion, the pole having its own pelvis, calices and ureter.

The left kidney was much smaller than the right, and normal in size, its length being 6.5 cm., diameter 3.5 cm., and circumference 13 cm. The upper pole was separated by a fibrous band, and though small had its own pelvis and a few calices. The main portion of the gland was perfectly normal, both cortex and medulla; the calices and pelvis, of course, were dilated, for a hydronephrosis existed in Ureters A, B and D. No calculi were present in any portion of the urinary tract.

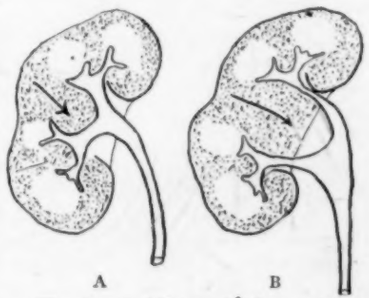

Fig. 3.—*A*, kidney showing pressure on the pelvis; *B*, kidney and divided renal pelvis, due to pressure.

The bladder was distended and its mucosa was thickened but not trabeculated. The ureter openings of A and D were of normal size; that of B was quite large. The prostate was small and fibrous. There was a stricture of the urethra 1 cm. anterior to the prostate, just admitting a No. 6 catheter.

COMMENT

As scientists we are interested in this congenital abnormality, tracing its embryologic development from the wolffian duct. The division starts as a rule in the kidney, by a deep column of cortical substance, forc-

* Reported before the King County Medical Society, Feb. 7, 1916.

ing its way down to the hilum forming two portions of the urinary gland as in Figure 3. This division may stop at the hilum or continue on down and form a branched ureter, or remain double all the way to the bladder, each having a distinct outlet and opening in the bladder. Also, most interesting are the divisions in the kidneys, suggesting four secreting organs.

As practical surgeons, we ask ourselves if the early death of this child could have been prevented by operative measures. Necropsy gave a remarkable picture of the ultimate effects on the urinary tract of obstruction and resulting back pressure. The primary obstruction appears in the posterior urethra, and in time death occurred from uremia.

964 Empire Building.

TYPHOID VACCINATION

ROUTINE IMMUNIZATION OF THIRTY-FIVE HUNDRED PATIENTS IN AN INSTITUTION *

PAUL G. WESTON, M.D.

WARREN, PA.

In 1912 I immunized 898 patients of this hospital against typhoid fever and reported the procedure.[1] Inoculation of all patients was made a matter of routine, and the number of subjects immunized since the last report was written is 2,602. In view of the paucity of similar reports in American medical literature, it seems worth while to bring the report up to date.

The principal reports of *en masse* antityphoid inoculation which I have been able to find, excluding those from the army, are summarized in Table 1.

"Time" in the table refers to the time after the last inoculation was made that the blood was taken for agglutination tests.

In this institution inoculation is voluntary for the attendants and compulsory for the patients. At first all patients over 50 years of age were excluded, as well as the patients who presented distinct contraindications. But shortly after the immunization of the first 898 patients, two cases of typhoid fever developed, one in a woman aged 65 and the other in a woman of 70. Since that time no patient has been exempted for age. A few are still omitted because of the presence of an infectious disease, nephritis, extreme enfeeblement or for other good reasons. Since immunization has been made a routine procedure, only one case of typhoid fever has developed, and that one was so mild that the diagnosis was settled only after repeated blood cultures had been made.

The vaccine used was made from the same strain of bacilli as that used by the army. The suspension of bacteria was made so that 0.5 c.c. contained either one-half billion or one billion bacilli.

Newly admitted patients are not immunized at the time of admission, but at intervals of six months all patients admitted during that time are inoculated on the same day. In an institution for the insane the procedure is rendered difficult by the resistance of some of the patients. For this reason it has been found convenient to make the inoculations at night after the patients have retired. An assistant carries two wide mouthed 30 c.c. bottles, one containing the bacterin, and the other a piece of cotton saturated with iodin. Other assistants are sent ahead rolling up sleeves. All glass syringes are used and platinum and steel needles. One needle is used for all subjects as long as it lasts, but a few extra ones are always taken along. The patient's arm is cleansed with alcohol at the insertion of the deltoid. The needle is drawn through the iodin cotton and then wiped off with cotton saturated with alcohol. By this method it is possible to inoculate all the patients of a ward in rapid succession, the time required being about thirty-three seconds per patient.

Three doses are given each patient, at intervals of ten days, the first dose containing one-half billion bacilli and the second and third doses each containing one billion.

TABLE 1.—SUMMARY OF PRINCIPAL ANTITYPHOID INOCULATION REPORTS

No.	Author	Reference	Number Inoculated	Reactions, per Cent.				Agglutination Tests								
				None	Mild	Mod.	Sev.	Number Tested	Method	Time	Dilutions and per Cent. Positive						
											1/25	1/50	1/100	1/120	1/250	1/500	1/1000
1	Davis, D. J.	THE JOURNAL, Feb. 24, 1912, p. 587	91					91		Two weeks				100			
2	Hachtel, F. W., and Stoner, H. W.	THE JOURNAL, Oct. 12, 1912, p. 1364	2,044	56.7		38.4	4.8		Macro.	Two weeks							
3	Spooner, L. R.	THE JOURNAL, Oct. 12, 1912, p. 1359	400	86.		10.	4.	100	Micro.	Two weeks	94.2	80.6					
4	Weston, P. G.	THE JOURNAL, Oct. 26, 1912, p. 1536	898	98.7	0.4	0.8	0.1	898	Macro.	Ten days					100	97.7	92.25
5	Clark, O.	Iowa State Med. Jour., 1912, xix, 1	160	70.	28.	2.											
6	Brannan, J. W.	Med. Rec., New York, 1913, lxxxiii, 1	250				Very few										
7	Force, A. J.*	Am. Jour. Pub. Health, 1913, iii, 750	261		0.7	1.2	0.9										
8	Meyer, A.	Med. Rec., New York, 1913, lxxxv, 1	115	10.4	64.3	24.3	0.87	56		Ten days	74.	28.7					
9	Pierce, S. J. S.	Canada Med. Assn. Jour., 1914, iv, 853	445														
10	Pratt, E. C.	Illinois Med. Jour., 1914, xxvi, 571	3,150				0.47										
11	Wade, E. M., and McDaniel, O.	Am. Jour. Pub. Health, 1915, v, 136						1,179	Micro.	One day to 4 weeks		92.8					
12	Trowbridge, E. H.; Finkle, B. A., and Barnard, E. M.†	THE JOURNAL, Feb. 27, 1915, p. 728	1,520					1,390									
13	Burlingame, C. C.	Journal-Lancet, 1915, xxxv, 165	2,000				0.	1,942									

* Gay-Claypole vaccine.
† 34.3 positive Widals; three months after inoculation had an epidemic of typhoid, 57 cases; 86 per cent. positive Widals.

* From the laboratory of the State Hospital.

1. Weston, P. G.: Immunization Against Typhoid of Eight Hundred and Ninety-Eight Patients in an Institution, THE JOURNAL A. M. A., Oct. 26, 1912, p. 1536.

In all, over 10,500 inoculations have been made. Many of the patients slept through the inoculation, and knew nothing of it until the next day.

The reactions were classed as follows:

Mild: An area of hyperemia from 5 to 7 cm. in diameter with or without edema and a feeling of soreness in the arm.

Moderate: Marked hyperemia and edema extending to the elbow; pains in the arm and general lassitude.

Severe: Marked hyperemia and edema, chills, pains in back and legs, patient confined to bed.

TABLE 2.—REACTIONS

Dose.	Mild.	Moderate.	Severe.
1	3,498	1	1
2	3,480	18	2
3	3,455	40	5

Table 2 includes the 898 cases previously reported under the headings "none" and "mild."

Agglutination tests were carried on in the manner described in the former paper.[1]

Blood taken from 2,500 patients before inoculation failed in every case to cause agglutination at a dilution of 1:250.

Blood taken ten days after the last inoculation of 2,500 cases, including the 898 cases previously reported, gave the following results: positive at 1:250, 100 per cent.; positive at 1:500, 98.2 per cent.; positive at 1:1,000, 97.6 per cent.; positive at 1:10,000, 91 per cent. of the 1,500 cases tested.

The duration of the immunity is unknown. It is now three and one half years since the first inoculations were made. One case of typhoid fever developed three months after inoculation. It is not my intention to reinoculate any patients unless typhoid makes its appearance among the immunized.

SPINAL ANESTHESIA

ANALYSIS OF TWO HUNDRED AND EIGHTY CASES

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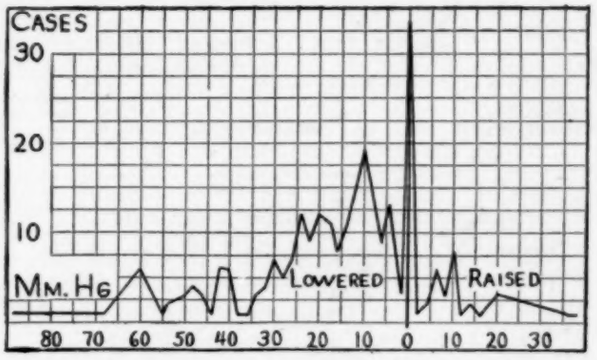
SAN QUENTIN, CALIF.

In the 280 cases in which spinal anesthesia has been used on the inmates at the San Quentin prison, tropacocain has been the agent employed. In ordinary operations, excepting those in which the abdominal viscera are handled, no hypnotic is given the patient before the operation. The patient walks to the operating room, mounts on the table, and is ordered to lie on his left side. The back from the fourth dorsal vertebra to the coccyx is painted over with official tincture of iodin. This is allowed to remain on the skin for a few minutes and is then removed with alcohol. The patient is directed to bring his knees as near to the chin as possible, producing a curved outline to the back. A sterile sheet with an aperture 6 inches in diameter is now placed over the patient so that the hole is near the site of the spinal puncture. A platinum needle of 12 mm. diameter and about 10 cm. long is used for the spinal puncture. The needle is inserted between the second and third, or third and fourth lumbar vertebrae. As soon as the canal is entered, the obturator of the needle is withdrawn and the fluid flows out. Immediately a Lüer syringe is attached to the needle, and 25 minims of the cerebrospinal fluid are withdrawn. The syringe is detached from the spinal needle, and by means of a shorter needle the fluid thus collected is used as a solvent for the tropacocain, which is put up in sterile ampules of 1½ grains' dosage. While the attendant is dissolving the tropacocain in the cerebrospinal fluid, the operator collects from 15 to 25 minims of the fluid for purposes of Wassermann examination. This having been done, a manometer is attached to the spinal needle and the spinal pressure determined. The manometer used is merely a piece of fine bored glass tubing with an elbow arranged so that the tubing extends at right angles upward from the spinal needle. The manometer is graduated, and the pressure is determined by the height to which the fluid ascends in the glass tubing.

The tropacocain having been dissolved in the fluid, the syringe is again attached to the spinal needle. In order to prevent any air entering the spinal canal, it is our custom to pull the piston out slightly before finally injecting the medicated solution. Since excluding the air in this way, the number of headaches following operation have been greatly reduced. The solution is injected slowly and the needle is quickly removed. The patient is then ordered to lie on his back. He is then placed in a Trendelenburg position at about 10 to 12 degrees from the horizontal. The head, however, is raised above the shoulders so that although the medicated fluid may gravitate toward the first dorsal vertebra, it will not well ascend toward the vicinity of the bulb.



Curve of relative amount of rise or fall in blood pressure at end of operation: readings to left of zero, lowered after operation; to right, raised.

Within one minute the patient feels that his feet are becoming warm, and he may even feel a tingling sensation in his toes. Within two minutes, sensation is lost about the anus, and as a rule within about four minutes there is such a loss of sensation that operations for hernia may be done without pain. For operations above the umbilicus it is our custom to allow the patient to stay in the Trendelenburg position for six or seven minutes, for apparently it takes this long for the tropacocain to gravitate cephalad to bathe the nerves which supply these segments. For operations about the anus, the average Trendelenburg position has been $1\frac{7}{10}$ minutes, for operations on varicose veins $2\frac{5}{10}$ minutes, for operations on the scrotum $2\frac{1}{10}$ minutes, for hernia, $3\frac{1}{10}$ minutes, and for gastroenterostomy, $4\frac{2}{10}$ minutes.

Tropacocain hydrochlorid in doses of 1½ grains is carefully weighed and put in thoroughly cleaned and dried homeopathic vials, long size. By means of a Bunsen burner the top is then fused so that the drug is sealed in an air tight ampule. These ampules are then sterilized either by boiling or by live steam in an

autoclave. Tropacocain is not injured by heat in this manner, and will keep indefinitely without deterioration or loss of anesthetic properties.

During every operation one attendant is assigned to watch the patient, and keep a record of his actions during the proceedings. All phenomena are carefully recorded chronologically, and remarks regarding the attitude of the patient are set down. In this series of cases the same man has done the recording so that there has been no variation, as would be expected had several operators kept the records.

The following is an illustration of a written operation record:

P., No. 28977, man, age 31, weight 147, logger.

INGUINAL HERNIA, DOUBLE

Jan. 12,	12:15 p. m.	Blood pressure: 110, systolic; 80, diastolic.
	12:16 p. m.	Pulse rate, 72.
	1:39 p. m.	Anesthetic administered, tropacocain 1½ grains, 2-3 lumbar.
	1:39 p. m.	Head lowered; Trendelenburg position.
	1:42 p. m.	Head raised; operation begun.
	1:43 p. m.	Pulse rate, 126; could not move feet.
	1:48 p. m.	Pulse rate, 96.
	1:52 p. m.	Blood pressure: 130, systolic; 76, diastolic.
	1:54 p. m.	Pulse rate, 90.
	2:00 p. m.	Pulse rate, 84.
	2:05 p. m.	Blood pressure: 112, systolic; 80, diastolic.
	2:06 p. m.	Pulse rate, 90.
	2:11 p. m.	Pulse rate, 90.
	2:12 p. m.	Blood pressure: 124, systolic; 80, diastolic.
	2:16 p. m.	Pulse rate, 90.
	2:23 p. m.	Pulse rate, 80; operation ended. Blood pressure: 124, systolic; 80, diastolic.
	3:35 p. m.	Felt first pain and could move feet.
	7:15 p. m.	Blood pressure: 108, systolic; 80, diastolic.
Jan. 20,	7:15 p. m.	Blood pressure: 128, systolic; 84, diastolic.

Remarks: Pupils not changed; complexion unchanged; puncture made patient recumbent left side; cord transplanted; pressure (spinal) 15 cm. Left table in good condition. No pain.

This work was done with the assistance of two former assistant resident physicians, Dr. F. Stolle and Dr. S. H. Marks, and with the present assistant resident physician, Dr. J. P. Crawford.

The accompanying table is a summary of all the operations. It is self-explanatory.

In the plotted curve of the relative amount of rise or fall in blood pressure at the end of operation, the base line is the amount of blood pressure, and the abscissa the number of cases. The readings were taken each time with a Tycos sphygmomanometer. It is seen from the chart that the maximum fall in blood pressure was 88, whereas the maximum rise was 38 mm.

In none of these cases, however, was the blood pressure so low that it was necessary to take measures toward increasing it. Although the pressure was low, the patient did not show any signs of collapse.

As to pulse rate, it is found that the rate increases as soon as the spinal puncture is made, but after a few minutes returns to the normal beat. This increase is probably due to the fact that the patient is somewhat excited when brought to the operating room. The psychical effect of seeing the operating room attendants and feeling the prick of the spinal needle is sufficient to cause this quickening. From the data it seems that the spinal anesthesia itself has very little if any influence on the pulse.

It is extremely difficult to determine the length of anesthesia because the statements of the patients are not reliable, and it was impossible to determine by means other than their statements regarding this matter. For the purpose of creating sympathy, there is no doubt that some of the patients complained of pain really before it was felt. Only a few, however, complained while they were on the operating table, and it was only necessary in four or five cases of the series in which the operation was over an hour and a half to administer a few whiffs of chloroform or ether to quiet the patient. As near as could be determined, the average length of anesthesia was one hour and fifteen minutes.

Only 8 per cent. complained of headaches. To many surgeons, headache has been the deterring factor for using spinal anesthesia. Some assert that headache is so severe that they will not subject their patients to it. By excluding all air from the spinal canal, however, as shown before, there is very little danger of headache.

Only 18 per cent. had to be catheterized, of which over half were in operations about the anus, in which catheterization is usually expected.

In very few cases after operation has there been any vomiting. It is an extremely rare after-effect. In ordinary cases, such as hernias, varicose veins and other operations in which the intestinal tract is not

SUMMARY OF OPERATIONS

	Operations on Feet	Varicose Veins	Various Operations on Legs	Fistula in Ano	Hemorrhoids	Operation on Scrotum	Hernia	Appendectomy	Gastro-Enterostomy	Totals
Cases, number	15	22	18	29	59	30	61	32	13	280
Fall in blood pressure, number	7	22	11	19	31	19	56	25	9	199, 71.1%
Rise in blood pressure, number	5	0	4	3	14	3	2	1	2	34, 12.1%
No change in blood pressure, number	1	1	2	7	13	5	1	3	1	34, 12.1%
No data on blood pressure, number	2	0	1	0	1	3	2	3	1	13, 4.7%
Maximum fall in blood pressure, mm.	60	46	50	50	42	54	88	68	48	88
Minimum fall in blood pressure, mm.	2	8	2	4	4	6	6	2	16	2
Average fall in blood pressure, mm.	27	23	9	9	5	13	22	21	15	15
Maximum rise in blood pressure, mm.	19	0	8	26	38	16	26	20	10	38
Minimum rise in blood pressure, mm.	2	0	6	4	6	5	10	10	10	2
Average blood pressure	125	116	117	114	115	115	119	118	118	117
Average spinal pressure	14	11.5	14	17	12.5	18	14.5	16	14	14.2
Average length of operation, minutes	33	26	18	18	15	17	35	50	77	28
Average length of anesthesia, minutes	33	61	70	63	75	70	74	107	?	75
Average age, years	39	42	36	31	38	32	50	31	33	34
Average weight, pounds	159	146	159	161	176	162	170	155	159	160
Headaches	2	8	0	0	7	1	3	2	1	24, 8%
Catheterized	2	0	3	4	27	0	4	12	4	52, 18%
Average Trendelenburg position, minutes	3.5	2.5	2.8	1.7	1.7	2.4	3.1	3.2	4.2	2.5

involved, the patients are allowed to eat as soon as they return from the operating room. No ill results have followed. The food is usually relished. By the early taking of nourishment in this way, shock is reduced and the patient's convalescence is shortened.

The preparation is the same as that usually given for the inhalent anesthetics. No hypnotic is given except as previously noted above.

In only two cases out of a possible 400 has it been found impossible to produce spinal anesthesia. One patient was a woman, aged 90, suffering from hemorrhoids. She was deaf, and it was impossible to instruct her to the best position she should attain. Several attempts were made to enter the spinal canal, but the vertebrae were so ankylosed that it was impossible. In another case, a Mexican, aged 25, was stabbed through the abdominal wall into the stomach so that his recently ingested stomach contents were voided through the opening. He was brought to the hospital thirty minutes after the affray, but was in a condition of shock, and his blood pressure was very low. The puncture was made, and 10 minims of cerebrospinal fluid removed. No more could be withdrawn. On account of the small amount of fluid, it was thought well not to administer the anesthetic. In several other cases it has been found necessary after a delay of ten minutes to make another puncture and inject more of the tropacocain. The failure of the first injection was probably due to the fact that the needle may have been accidentally pulled from out the canal and the tropacocain infiltrated around the dura instead of in the canal. Invariably after the second injection the anesthesia has been satisfactorily produced.

CONCLUSIONS

1. In this series of 280 cases there has been no fatality.
2. There has been comparatively little shock.
3. There has been only 8 per cent. headaches.
4. There has been no pneumonia following operation.
5. There have been very few postoperative complications.
6. There have been no permanent paralyses following the anesthetic.
7. The period of convalescence has been shortened.
8. With the relaxed muscles, closing of the abdomen is greatly facilitated.
9. The blood pressure has fallen in most cases, but in the average case not to a dangerous degree.
10. The height to which the anesthetic is effective is influenced by the length of time the patient is in the Trendelenburg position.
11. The pulse rate is not influenced to any marked degree by tropacocain intraspinally.

Quicksilver.—According to *Commerce Reports*, the domestic output of quicksilver in 1915 was estimated to be 20,681 flasks of 75 pounds each, valued at $1,700,000. The figures for 1914 were 16,548 flasks valued at about $800,000. There was an increase of 4,133 flasks and in value more than double. The estimated output of California in 1915 was 13,916 flasks. The European war directly affected the industry by greatly increasing the demand for the metal in the manufacture of fulminate for explosives and also by reducing the customary imports from foreign countries. The exports from the United States for the calendar year 1915 were about 3,300 flasks.

TWO CASES OF INFECTION WITH STRONGYLOIDES STERCORALIS

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Strongyloides stercoralis (*Anguillula stercoralis*) is an exceedingly common intestinal parasite in the tropics of both hemispheres, and not rare in certain subtropical regions. Its great rarity north of Mason and Dixon's line justifies the reporting of the following two cases:

CASE 1.—Rose Z., aged 6 years, native of the United States, of Italian parentage, gave a history of restlessness at night, grating of the teeth, and vague abdominal pains for a considerable period. The abdominal discomfort could not be accounted for by errors of diet or any physical finding. Moreover, the child seemed listless and anemic. Hookworm was suspected and the feces were examined, with the resultant finding of strongyloides in enormous numbers. A differential blood count showed 11 per cent. eosinophils.

CASE 2.—Mary Z., sister of Case 1, aged 9 years, native of the United States, had been suffering for some time from similar abdominal pains with some diarrhea. Because of the above mentioned findings, a similar examination was made, which showed the same parasite and 17 per cent. eosinophils.

After thorough treatment with thymol, the worms disappeared in both cases, and after three weeks the eosinophilia had fallen to 5 and 6 per cent., respectively. Another sister and the mother were likewise examined for parasites, with negative results. The source of infection in our two cases remains obscure, as the children have always lived in the city of New York, where this parasite is not native. There remains the possibility of paternal infection or derivation from some infected native of Italy. As in the case of hookworm, the invasion usually takes place through the skin.

The life cycle of this parasite is of considerable interest, and bears a close relationship to the various names which have been given it by a number of writers who have described its sexually different forms as distinct species. Thus the embryos (rhabditic form) were called *Rhabditis stercoralis, Rhabdonema strongyloides* and *Rhabdonema intestinale,* while the mature parasite was classified as *Anguillula stercoralis.*

The mother worm, the *Anguillula intestinalis,* deposits its eggs in the intestinal tract, where the rhabditic forms develop. The eggs themselves are seldom found in the feces, while the embryo is usually present in great numbers. In the foregoing cases we were unable to find a single egg after prolonged search. The embryo is not to be seen macroscopically, being but 0.2 mm. in length; microscopically it is seen to be actively motile, with a cylindric body tapering at both ends.

On keeping the stool at room temperature, the embryos increase considerably in size, reaching adult form (1 mm.) and sexual differentiation. They have remained alive in the stools in both cases for over two weeks.

These parasites are the etiologic factors in the disease known as "Cochin-China diarrhea," and while common in China, the West Indies and Italy, and not very uncommon in Germany, they are comparatively rare in the United States. Very few cases have been reported here, and most of these could be traced to a foreign country as the source of importation.

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Therapeutics

PRESCRIPTION WRITING

For almost every patient at some time during his treatment, one or more prescriptions must be written. Though surgical, special and specific treatments are the only correct methods of effecting a cure; though most acute diseases tend to recovery, and though hygiene and the correction of diet tend to eradicate abnormal conditions of the body, the patient may require medicinal treatment to stop pain, to promote nutrition, to increase general elimination, to decrease a certain abnormally profuse eliminative activity, to cause sleep, to supply or aid the activity of some internal secreting gland, and to soothe, stimulate or otherwise treat the external surface of the body. Hence, no matter how often some surgeons may state that they do not need drugs, and no matter how often some consultants may deplore the use of drugs, drug treatment has a legitimate use for the vast majority of patients.

These statements are not intended to declare that many chronic conditions, especially of the nervous system, are not better treated by physical methods than by drugs. It is a fact that too much medicine is often given. Successful drugless treatment of acute and really tangible chronic illness, however, is a myth. Of course, if there is nothing the matter, a person can be cured of what he does not have by what he does not get.

No one of sane mind doubts that there are useful drugs with a demonstrable activity. That these drugs can produce the symptoms and signs of their action in patients is known to every one who has had laboratory and subsequent clinical experience. These facts should compel two restrictions in the use of drugs: 1. A drug which is not known to have some definite, safe action should not be used. 2. Only one who has the knowledge of the action of a drug on the human being in health and in disease should prescribe that drug for a patient.

A self-evident corollary is that a mixture of drugs cannot be prepared or "kept in stock" to fit a patient who may need treatment some time in the future. Each patient should be individualized and receive the drug needed, in the amount needed to cause the effect desired. He should not receive a mixture of drugs made to fit a series of patients varying in age, size, nutrition, strength, and in the severity and complications of their disease, even if they have the same disease. Proprietary, drugstore, hospital, dispensary and office mixtures are unscientific, and at times may even be dangerous. A hospital may have stock palatable solutions (if they will keep) each of some one drug. In this case the physician may readily give the amount he desires of this one drug, and the treatment will be individual and scientific.

USELESS DRUGS

It may be said that there is no harm, even if there is no benefit, in giving a patient a useless drug or a useless mixture; the word "useless" meaning, when applied to a drug, that it has no known activity and is harmless. Nevertheless harm is done for several reasons:

1. Such a statement emanates from the venders of proprietary preparations and of nostrums, the object being "to sell the goods."

2. A prescription for a useless drug causes the druggist to stock that useless drug and its preparations. A series of such prescriptions causes the druggist to urge the pharmacopeial revision committee to make this useless drug official in the United States Pharmacopeia, and causes the revision committee to attempt to give this substance a standard (generally impossible). This drug, being officialized (because "there is a demand for it"), must have official preparations, which are largely made by pharmaceutical firms, and the latter reap a large income, because up-to-date retail druggists are compelled to stock what is official in the United States Pharmacopeia. The medical student and the young practitioner, finding this drug in the standard book, the United States Pharmacopeia, *ipso facto* believe that it must be a "useful" drug. The young practitioner begins to prescribe this drug either by prescription or by proxy (some proprietary contains it perhaps), and the crime of false pretense is complete.

3. The patient may recover while taking this harmless drug, and both he and his physician, unless the latter is wise, believe that the drug accomplished this result on account of the mystery attached to the preparation, because of ignorance of its having any known activity. Later, the patient recommends the preparation to someone else, and the physician himself uses the drug again. If the patient had recovered while taking a placebo, the physician, at least, would not have been deceived, and the record of the crime of fallacy need not have been written.

4. Even a useless drug prescribed for a patient who needs nothing may foster a habit of taking medicine, when the proper treatment is to teach such a patient that no medicine is needed.

HOSPITAL MIXTURES

Investigators have shown that the medical profession is writing more simple prescriptions and is less frequently ordering mixtures and proprietaries. Nevertheless far too many fool combinations are being forced into the stomachs of suffering humanity, especially hospital patients. House-mixtures in hospitals are usually known by some semidistinctive title; but the ingredients and their amounts are not known; at least they are soon forgotten by the visiting physician and the hospital intern. If these mixtures seem to be of benefit to the hospital patients, the intern begins to think that these particular combinations are mystic; he does not realize that it is the one or two active useful drugs that did the good work, even if they were hampered by some old fashioned combination. When the intern goes into active private practice he does not know how to write an individual prescription for an individual patient. Hence he looks up his old hospital formulary, and copies the hospital mixtures, until some proprietary detail man convinces him that a proprietary mixture is better. He seizes on this, especially as he has found that his private patients will not, without more or less murmuring or rebellion, take the hospital mixtures. Thus the use of proprietary preparations is promoted by the hospitals. Many of the United States Pharmacopeial multiple mixtures are only copies of old nostrums, pet formulas of some ancient clinician, or improvements on hospital mixtures.

To be concrete, let us write simple prescriptions for drugs that are of value, that is, useful drugs in the best official preparation, and, if soluble, in the most agreeable solution possible. The value, in many

instances, of a suitable combination of active drugs individualized to the patient is not to be doubted. A pharmaceutical firm which offers an elegant preparation or a pleasant method of administration of a disagreeable, though valuable drug, or which presents a purer valuable drug, should be commended, and such preparations should be used. If a new synthetic or a more pure alkaloidal product of a useful drug, offered by a chemical firm, has been found worthy of recognition by the Council on Pharmacy and Chemistry, it should be used in suitable cases.

LATIN

It has been urged that the Latin of prescriptions is generally incorrect and that Latin is unnecessary. It is a fact that many of the medical schools do not now require Latin as a preliminary study. It has also been urged that the Latin chemical name makes the drug or preparation international and the pharmacopeias of the various nations and the books on materia medica, chemistry, pharmacology, etc., are all adopting these names. It should be remembered, however, that the Latinized titles of the various pharmacopeias differ widely. It seems wise for the present to write the titles of drugs in their official names, not in their American or local names, but Latinizing the sentences need not be insisted on. The ninth revision of the United States Pharmacopeia, which will soon be in print, has created official abbreviations which will shorten the long Latin names without causing confusion when such are used.

Another unification much to be desired is the international adoption of the metric system. This will not succeed in this country so long as the hospital repudiates the medical school instruction in the metric system by constantly using the apothecaries' system of weights and measures. The medical student writes prescriptions in the decimal system, but, generally, after he has served two years as a hospital intern, he is a hopeless habitué of the old apothecaries' system.

Education and scientific knowledge do not save a man from belief in the mysterious, or in talismans, amulets, etc. An otherwise sane man will carry a horsechestnut or wear an iron ring, or an ignorant woman will claim to stop the night sweats of phthisis by putting a pan of water under the bed (this is a recent fact, and not romance). There can be no other excuse than the belief in mystery for the otherwise able practitioner who writes prescriptions ordering some proprietary mixtures.

VEHICLES

A large number of elaborate combinations are made and sold under different names to cover the taste of drugs which are simple and useful, but disagreeable to take. Sweetness does not always make a bad tasting drug less disagreeable. Many a more or less nauseating drug is much better tolerated by dissolving it in a sour mixture, as in syrup of citric acid and water. A drug dissolved in simple water may be added to fresh lemonade or orangeade. Peppermint is pleasing to most people. As disagreeable a drug as potassium chlorate used as a gargle may be well dissolved in peppermint water.

Many drugs may be pleasantly administered in effervescing water. This may be either a simple carbonated water, or an alkaline water as Vichy. Even insoluble powders may be given this way, the powder, bismuth salts, for instance, being suspended by the air globules.

An oil like castor oil or cod liver oil may be disguised by placing a little salt in the bottom of a wineglass, filling the glass half full of water, without stirring to dissolve the salt, and then placing the oil carefully on top of the water. If this mixture is rapidly swallowed, the only taste is that of the salt. Castor oil is variously disguised by the addition of a small amount of saccharin and a little oil of anise or wintergreen, and may then be given in a little orangeade. It may be further disguised by adding fluidextract of licorice.

The disagreeable taste of Epsom salt may also be disguised by a little saccharin and oil of anise, peppermint or wintergreen.

When it is not advisable to take cascara sagrada in tablets (or if the tablet is disagreeable, powdered and placed in a capsule and thus swallowed), it has been disguised in many aromatic preparations, the dose of which is considerable in order to obtain the proper amount of the cascara sagrada. Any efficient druggist can suggest an aromatic combination that will disguise the fluidextract of this drug.

A pleasant method of administering many disagreeable drugs to children is in a teaspoonful or tablespoonful of freshly made cocoa or chocolate. A little sweetened chocolate may be crushed by the mother and given with the powder or solution.

In order to apply these principles, it is proposed, from time to time, to outline at least one recommended and used mixture, discuss its mistakes or fallacies, and suggest an efficient, logical and ethical method of prescribing the useful drugs needed for the patient suffering from the disease or condition against which the mixture is aimed.

(To be continued)

Influence of Economic and Industrial Conditions in Infant Mortality.—Henry Horace Hibbs, Jr., has stated recently (*Quarterly Journal of Economics,* November, 1915) the result of his analysis of the reports of governmental committees and sociologic organizations and of individuals on the foregoing subject. "It appears," he says, "that the fundamental cause of the excessive rate of infant mortality in industrial communities is poverty, inadequate incomes, and low standards of living with their attendant evils, including the gainful employment of mothers. The employment of the mother in gainful occupations is simply the remedy for these evils or 'adverse conditions' which the working people in industrial communities have adopted. Undoubtedly, this recourse has had an important effect on the problem, in many cases actually tending to reduce the rate of infant mortality, while in others having just the opposite effect. The primary question in considering the social causes of infant mortality is whether the employment of mothers and married women in extradomestic occupations is, from the viewpoint of society as a whole, a good remedy for poverty and an acceptable means of mitigating its influence on the health and mortality of babies and young children. From the point of view of the individual poor or poverty stricken family, the fact cannot be escaped that this effect may be both good and bad; bad, in that it causes the baby to be artificially fed, forces the mother to be absent from home, and in other ways lowers her efficiency as a mother; good, in that it increases the family income and decreases the influence of poverty. We are thus forced to conclude that the fundamental economic and industrial factor of infant mortality is low wages. The fundamental remedy is obviously higher wages. Other remedies, such as legislation restricting or regulating the employment of mothers before and after confinement, day nurseries, the instruction of mothers and school girls in domestic economy, and the like, all have their place; but the chief thing remains the provision of an adequate family income."

STATE BOARD STATISTICS FOR 1915

ANNUAL PRESENTATION BY THE COUNCIL ON MEDICAL EDUCATION OF RESULTS OF STATE BOARD EXAMINATIONS

On pages 1096 to 1105 are three tables, A, B and C, giving in detail the results of the various state medical license examinations held during 1915. These statistics are complete, since full reports were obtained from all state licensing boards and all have been carefully verified.

Tables A and B have been arranged so that, read from left to right, they give the results by colleges, showing the number of graduates appearing for examination in each state, whether they passed or failed, the total number examined during the year, the number who passed, the number who failed, the percentage of failures, and the number of states in which graduates of each school appeared for examination. Read from above downward, they give the results by states, showing the number registered and rejected from each college, the total number examined, the total number registered, the total number rejected, and the percentage of rejections. The fact that the majority of graduates take the license examination in the state in which the college is located is shown by the dark diagonal zone made by the grouping of figures, passing from the upper left to the lower right corner of each table. This shows also that *the states in which low-grade medical schools are permitted to exist are themselves the recipients of the greater portion of the ill-trained output of such schools.* These tables are worthy of careful study, since important deductions are possible. The marginal numbers will enable the reader more readily to follow the line for any college in which he is interested.

Caution in Forming Conclusions

In making comparisons on the basis of these statistics, several factors should be kept in mind. The number examined is important, since, if all other conditions are equal, the larger the number of graduates examined, the more accurate is the finding. But other conditions are seldom equal. The number of states in which a school's graduates have been examined is important. The larger this number the more accurate will be the conclusions. Again, the character of the board making the examination and the methods employed are important factors to be considered, since some boards hold very careful examinations and include practical laboratory and clinical tests, or they may mark the papers more severely, while others, especially partisan boards, may be very lenient. In this connection it should be stated that although conditions are undergoing a steady improvement, it is still true that *the character of the license examination as usually conducted is such that graduates of colleges conducted largely by quiz-class methods may easily be successful in passing it.* It is particularly important in forming conclusions based on these statistics to note for each college the states in which its graduates are not admitted to examinations—information set forth with these statistics in Table D.

Graduates of All Years Examined in 1915

Table A shows the results for all candidates who took examinations in 1915, regardless of the years in which they graduated. This shows that altogether 5,313 candidates were examined last year, as compared with 5,570 in 1914, 6,435 in 1913, 6,879 in 1912 and 6,960 in 1911. There has been a steady decrease each year since 1906, when 8,035 physicians were examined. The decrease each year has been due largely to (1) the wider extension of reciprocity and (2) the general diminution in the number of medical colleges, students and graduates. Of those examined this year, 15.6 per cent. failed, as compared with 21.6 per cent. in 1914, and 18.6 per cent. in 1913, 20.5 per cent. in 1912 and 19.9 per cent. in 1911.

There were 93 medical colleges in the United States granting degrees in 1915 which had graduates examined, as compared with 96 in 1914, 99 in 1913 and 110 in 1912. This is a decrease of 60 since 1905, when graduates of 153 medical colleges in the United States were examined. Foreign graduates were examined in twenty-five states, the total number being 86, and of this number 34, or 39.5 per cent., failed. The largest number of foreigners examined in any state was 22 in New York, where 11, or 50 per cent., failed. Graduates of Canadian schools were examined in nineteen states, more appearing, naturally, in the border-line states. The figures for the Canadian colleges are given separately in order to show the number of candidates coming from each as well as to show the successes of their graduates at the examinations. Altogether 60 candidates from Canadian colleges were examined, of whom 11, or 18.3 per cent., failed. Of all Canadian colleges, the University of Toronto had the largest number examined. The highest percentages of failures were for Montreal School of Medicine and Surgery, 100; Laval University, 50, and Queen's University, 21.4.

Undergraduates Examined During 1915

Line 105 of Table A shows the number of nongraduates examined in six states during 1915. Altogether 65 nongraduates were examined in 1915, as compared with 293 in 1914, 330 in 1911, and 703, the largest number, in 1906. Of the 65 examined in 1915, 32, or 49.2 per cent., failed, as compared with 61.4 per cent. in 1914, 37.8 per cent. in 1913, 35 per cent. in 1912, and 38.5 per cent. in 1911. Such candidates were examined during 1915 in Colorado, Massachusetts, North Carolina, Oregon and Tennessee. Of such candidates, 13 each were licensed in Massachusetts and Tennessee, 2 each in Colorado, Maine* and North Carolina, and 1 in Oregon. Meanwhile, last year, Tennessee, Massachusetts and Oregon obtained legislation requiring that all candidates shall be graduates of medical colleges. This leaves only Colorado which will examine nongraduates. Only four nongraduates, however, have been licensed in that state in ten years. The door has practically been closed, therefore, against the licensing of nongraduates—those whose medical training is known to be incomplete.

Recent Graduates Examined During 1915

Table B gives the results for graduates of 1911 to 1915, inclusive, who were examined during 1915. This table is particularly important, since it deals with recent graduates, and is, therefore, the fairest basis for comparison between colleges. Such comparisons are worthless, however, unless reference is also made to Table D, which shows in what states graduates of certain colleges are reported not eligible for examination. Of all candidates examined in 1915, 4,627, or 87.1 per cent., were recent graduates, and of this number 13.2 per cent. failed, as compared with 15.6 per cent. for all candidates. The figures regarding graduates of several medical schools which have ceased to exist, either through merger or otherwise, have been included in the line for miscellaneous colleges.

Old Practitioners Examined During 1915

Table C is so arranged as to show in comparison the results for graduates of all years (first column), for recent graduates (second column), for graduates of 1910 and previous years (third column), and for graduates of 1915 (fourth column). Of the graduates of 1910 and previous years—"old practitioners"—621 were examined, and of this number 182, or 29.3 per cent., failed, as compared with 13.2 per cent. of failures for recent graduates. This high percentage of failures is probably due chiefly to the long time these candidates have been out of college and to the fact that they are required to take the same examination as recent graduates. Undoubtedly, the less favorable conditions in medical colleges at the time these physicians graduated have had some bearing on

* The two licensed in Maine claimed graduation, which appears to be refuted by official reports.

CONTINUED ON PAGE 1108

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 District of Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	ALABAMA																																											
1	Birmingham Medical College	17	25																	1	2	12	2																					1
2	University of Alabama, School of Medicine	11	1																											1	0					2	1									2
	ARKANSAS																																										
3	University of Arkansas, Medical Dept.							21	1																																			3
	CALIFORNIA																																										
4	California Eclectic Medical College.—E.							1	0	6	6																																	4
5	College of Medical Evangelists									9	0																																	5
6	College of Physicians and Surgeons, Los Angeles					1	0			25	3																																	6
7	College of Physician and Surgeons, San Francisco			1	0	0	1			3	1																																	7
8	Hahnemann Medical College of the Pacific.—H.									7	0																																	8
9	Leland Stanford Junior Univ., School of Medicine									14	0																																	9
10	Oakland College of Medicine and Surgery									5	1																																	10
11	University of California Medical School									14	0																																	11
	COLORADO																																										
12	University of Colorado, School of Medicine											7	0											1	0																			12
	CONNECTICUT																																										
13	Yale University, School of Medicine													4	0																									1	0			13
	DISTRICT OF COLUMBIA																																										
14	Georgetown University, School of Medicine																	14	0							1	0											2	0	4	2			14
15	George Washington University Medical School																	15	2	1	0					2	0									2	0							15
16	Howard University, School of Medicine																	9	5			1	0			0	1	1	0			3	0			2	1			4	3			16
	GEORGIA																																										
17	Atlanta Medical College	0	2																	15	1	115	2													1	0			1	0			17
18	Georgia College of Eclectic Med. and Surg.—E.							2	0													1	0									1	0											18
19	University of Georgia, Medical Dept.	0	1	1	0															0	1	12	0																					19
	ILLINOIS																																										
20	Bennett Medical College																			0	1	2	1			64	16			2	0	1	0					0	1					20
21	Chicago College of Medicine and Surgery	3	3					1	0	0	1							1	0			1	1			78	16	1	0	11	0					1	1	1	3	0	2	0		21
22	Chicago Hospital College of Medicine																									2	3																	22
23	Hahnemann Medical College and Hospital.—H.	0	1									1	0							7	0					20	4			3	1	1	0							1	1			23
24	Jenner Medical College									1	1															21	1																	24
25	Northwestern University Medical School									1	0															35	1	1	0	8	0	1	0											25
26	Rush Medical College			1	0	1	0			2	0			1	0					0	1	1	0	1	0	76	0	2	0	6	1	1	0			1	0			1	0			26
27	University of Illinois, College of Medicine					1	0			1	0											1	0	2	0	87	2	0	1	6	0									2	0			27
	INDIANA																																										
28	Indiana University, School of Medicine																							1	0			27	0	1	0			1	0									28
	IOWA																																										
29	State University of Iowa, College of Medicine			1	0					1	0									1	0			1	0	1	1			23	0													29
30	State Univ. of Iowa, Coll. of Homeo. Med.—H.																													2	0													30
	KANSAS																																										
31	University of Kansas, School of Medicine													0	1																	11	0									1	0			31
	KENTUCKY																																										
32	University of Louisville, Medical Department	1	0					2	0			1	0							3	0	1	0			2	1	7	0					55	3					0	1			32
	LOUISIANA																																										
33	Tulane University of Louisiana, School of Med.	8	0			0	1			1	0			1	0					4	0															52	3					1	0			33
	MAINE																																					22	1			4	1			
34	Bowdoin Medical School																																											34
	MARYLAND																																										
35	College of Physicians and Surgeons of Baltimore													1	1					1	0																	2	0	13	5	7	2			35
36	Johns Hopkins University, Medical Dept.	1	0							1	0			5	0			5	0	2	0	3	0			2	0	1	0	1	0									38	0	8	0			36
37	University of Maryland, School of Medicine													1	0					1	0					2	0	1	0									1	0	42	5	2	1			37
	MASSACHUSETTS																																										
38	Boston University, School of Medicine.—H.																									1	0					1	0					3	0			14	0			38
39	College of Physicians and Surgeons, Boston													0	3			1	0	3	0																	6	2			5	4			39
40	Medical School of Harvard University									1	1			5	1											5	0	1	0	4	0							8	0	1	1	51	0			40
41	Tufts College Medical School					1	0			1	1			1	0							1	0	1	0	1	0			1	0							5	1			63	9			41
	MICHIGAN																																										
42	Detroit College of Medicine and Surgery																									1	0															45	2			42
43	University of Michigan Medical School	1	0	1	0													1	1	1	0							1	0											2	0	41	1			43
44	University of Michigan, Homeo. Med. School.—H.																			1	0																					17	3			44
	MINNESOTA																																										
45	University of Minnesota Medical School																									1	0					1	0											45
	MISSOURI																																										
46	Eclectic Medical University.—E.							19	2																																			46
47	Kansas City Hahnemann Medical College.—H.																															1	1											47
48	National University of Arts and Sciences																									2	2			1	0													48
49	St. Louis College of Physicians and Surgeons									1	0															2	1			1	0			0	1									49
50	St. Louis University, School of Medicine	1	0					1	0															1	0	3	1			2	0			1	0					1	0			50
51	Washington University Medical School							1	0											1	0					2	0																	51
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H.—Homeopathic; E.—Eclectic; P.—Passed; F.—Failed.

| Marginal Number | 23 | | 24 | | 25 | | 26 | | 27 | | 28 | | 29 | | 30 | | 31 | | 32 | | 33 | | 34 | | 35 | | 36 | | 37 | | 38 | | 39 | | 40 | | 41 | | 42 | | 43 | | 44 | | 45 | | 46 | | 47 | | 48 | | 49 | | 50 | | | | | | | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 District of Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	NEBRASKA																																											
52	Lincoln Medical College.—E.																			0	1																									52
53	John A. Creighton Medical College											4	0													2	0			2	0	1	0											53
54	University of Nebraska, College of Medicine																									1	0					1	0											54
	NEW HAMPSHIRE																																										
55	Dartmouth Medical School													1	0																							1	0			1	1			55
	NEW YORK																																										
56	Albany Medical College													2	0																									2	0			56
57	Columbia University, College of Phys. and Surgs.	1	0							1	0	1	0	8	1					1	0			1	0													3	0			57
58	Cornell University Medical College									1	0			0	1											1	0											1	0			58
59	Fordham University, School of Medicine																	1	1							1	0											1	0			59
60	Long Island College Hospital																			1	0																	1	0			60
61	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.					1	0			2	0			3	0	2	0	0	1																	2	0	2	0	1	0	61
62	N. Y. Med. Coll. and Hosp. for Women.—H.																																									62
63	Syracuse University, College of Medicine															1	0			1	0																					63
64	University of Bellevue Hospital Medical College													2	0																							2	0			1	0	64
65	University of Buffalo Medical Dept.																																							1	0			65
	NORTH CAROLINA																																										
66	Leonard Medical School	1	0																	0	1	1	0																					66
67	North Carolina Medical College																																											67
	OHIO																																										
68	Eclectic Medical College.—E.							1	0																	1	1															1	0	68
69	Ohio State University, College of Medicine																																					1	0					69
70	Ohio State University, Coll. of Homeo. Med.—H.																																										70
71	University of Cincinnati, College of Medicine																																										71
72	Western Reserve University, School of Medicine	1	0																											1	0							1	0					72
	OKLAHOMA																																										
73	University of Oklahoma, School of Medicine					0	1																									4	0											73
	OREGON																																										
74	University of Oregon, Department of Medicine																																	1	0							1	0	74
	PENNSYLVANIA																																										
75	Hahnemann Medical College and Hospital.—H.															3	0			2	0																							75
76	Jefferson Medical College									8	0			3	0	3	0			3	0	2	0	2	0			1	0	1	0	1	0	1	0					4	1			76
77	Medico-Chirurgical College of Philadelphia	1	0			1	0			1	0			1	1	2	0							1	0													2	0			77
78	Temple University, Department of Medicine																																					2	0	3	0			78
79	University of Pennsylvania, School of Medicine	1	0							1	0					1	0			2	0	2	0	1	0	1	1							1	0	1	0	3	0	3	0	79
80	University of Pittsburgh, School of Medicine											0	1	0	1																									1	0	80
81	Woman's Medical College of Pennsylvania									1	0			1	0					2	0																	3	0					81
	SOUTH CAROLINA																																										
82	Medical College of the State of South Carolina																			1	0																							82
	TENNESSEE																																	2	0									
83	Lincoln Memorial University, Medical Dept.																																									83
84	Meharry Medical College	3	1					3	2	0	1			0	1			0	1	4	3	17	8			3	4			1	1	0	1	5	0	1	1					84
85	University of Tennessee, College of Medicine	5	1					14	0											1	0	1	0											1	0	3	5	1	0					85
86	Univ. of West Tennessee, Coll. of Med. and Surg.																			0	1																	1	0			0	2	86
87	Vanderbilt University, Medical Dept.	7	1			1	1	4	1	0	1	1	0							2	1	0	1											12	0									87
	TEXAS																																										
88	Baylor University, College of Medicine																																										88
89	Fort Worth School of Medicine																																									89
90	Southern Methodist University, Medical Dept.																																										90
91	University of Texas, Department of Medicine																									1	0																	91
	VERMONT																																										
92	University of Vermont, College of Medicine													6	2			1	0	1	0			2	0	1	0											1	0	7	2	1	0	92
	VIRGINIA																																	1	0					0	3			
93	Medical College of Virginia																																										93
94	University of Virginia, Department of Medicine	1	0					1	0									3	0					1	0	1	0													2	0	1	0	94
	WISCONSIN																																										
95	Marquette University, School of Medicine									1	0													1	0	1	0															95
	CANADA																																							1	2			
96	Laval University, Faculty of Medicine																																									96
97	McGill University, Faculty of Medicine					1	0			1	0																											3	0			97
98	Montreal School of Medicine and Surgery																																					0	1			98
99	Queen's University, Faculty of Medicine																			1	0					1	0			1	0											99
100	University of Manitoba, Manitoba Med. Coll.																																									100
101	University of Toronto, Faculty of Medicine									1	1											1	0					0	1	1	0					1	0	2	0	101
102	Western University, Faculty of Medicine																																							2	0	102
103	Foreign Colleges					1	1			2	1	2	1	0	2	1	0	0	1							6	2	0	1					1	0	1	1	5	0			103
104	Miscellaneous Medical Colleges	5	9	1	0	1	2	4	1	23	20	0	2	0	3			0	1	19	10	1	2	6	1	7	6	4	0	6	1	0	2	3	3	2	9	1	1	1	8	9	11	1	0	104
105	Undergraduates											2	0																									2	0			13	25			105
	Totals by States	124		6		17		82		176		24		63		13		64		106		193		24		503		52		89		39		90		90		69		140		303		126		
	Totals—Examined—Passed	79		6		10		75		137		19		46		13		51		85		176		23		439		49		85		29		83		69		63		111		238		120		
	Totals—Examined—Failed	45		0		7		7		39		5		17		0		13		21		17		1		64		3		4		4		7		21		6		29		65		6		
	Percentage of Failures	36.3		0.0		41.2		8.5		22.2		20.8		27.0		0.0		20.3		23.1		8.8		4.2		12.7		5.8		4.5		12.1		7.8		23.3		8.7		20.7		21.4		4.8		
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H.—Homeopathic; E.—Eclectic; P.—Passed; F.—Failed.

Marginal Number	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Totals	Examined—Passed	Examined—Failed	Percentage of Failures	No. States Ex. in	Marginal Number
	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming						
	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
52					5 3																				1 0				9	5	4	44.4	2	52
53				1 0	4 1	38 1						1 0							3 0			3 0			1 0			2 0	62	60	2	3.2	11	53
54						9 0													1 0						1 0				15	15	0	0.0	6	54
55							3 0	1 0		1 0						1 0									1 0				11	10	1	9.1	8	55
56								1 0		56 18						1 0			1 0										81	63	18	22.2	6	56
57			1 0					1 0		68 9	5 0				1 0			1 0		1 0	1 0			1 0	1 0		1 0		103	88	10	9.3	15	57
58	1 0							4 1		21 1																			29	27	2	6.9	8	58
59								2 0		28 20						1 0								1 0		1 0			58	36	22	37.9	6	59
60								8 0		33 24											1 0								108	98	10	9.3	5	60
61										5 2																			88	63	25	28.4	13	61
62										17 4																			7	5	2	28.6	1	62
63								5 0		86 4															1 0			1 0	24	20	4	16.7	4	63
64			2 0							59 6						1 0													103	99	4	3.9	7	64
65																													67	61	6	8.9	3	65
66											6 2			1 1				0 2						0 1		1 0			13	9	4	30.8	5	66
67											21 7																		32	22	10	31.2	4	67
68					2 0					0 1			20 0			1 0				2 0									30	28	2	6.7	8	68
69												0 1	46 1												3 0	3 0			54	52	2	3.7	5	69
70													19 1																20	19	1	5.0	1	70
71										0 1			19 0																20	19	1	5.0	2	71
72													32 0									2 0							37	37	0	0.0	5	72
73														12 1				0 1											19	16	3	15.8	4	73
74				1 0											14 6										3 0				26	20	6	23.1	5	74
75	1 0							2 0		2 0					1 0	5 0	1 0								2 0		2 0		19	19	0	0.0	9	75
76		2 0	2 0	3 0				17 0		12 5	12 0			1 0	5 0	50 5	0 1	4 0				1 0		2 0	3 0	1 0			167	154	13	7.8	30	76
77						1 0		6 0		3 4	2 1					41 2	0 1					1 0							73	64	9	12.3	15	77
78			1 0													11 4							1 0						22	18	4	18.2	5	78
79					1 0			8 0		14 4	5 0				1 0	32 0				1 0				1 1	2 0	2 0			91	83	6	6.6	22	79
80													1 0			41 2										1 0			48	44	4	8.3	6	80
81								3 0		6 2	2 0		1 0		1 0	4 0		1 0							1 0	1 0			29	27	2	6.9	13	81
82											1 2							25 6											35	27	8	22.9	3	82
83		1 0									1 1			3 2	1 0			2 7		10 1									16	14	2	12.5	4	83
84		5 6	11 2								3 1			3 3				0 1		5 1	8 1								137	91	46	33.6	23	84
85		21 3		2 0														1 2		6 0	0 2								80	65	15	18.7	13	85
86		14 6									3 4									22 0	14 0								42	25	17	40.5	8	86
87		7 0	4 0	1 0						6 0		1 0		0 1										1 1	0 1				92	83	9	9.8	18	87
88		1 0												3 0							16 0 11 1								20	20	0	0.0	3	88
89			1 0											1 0							2 0								13	12	1	7.7	2	89
90																					32 0								6	6	0	0.0	2	90
91										1 0																			34	34	0	0.0	3	91
92							2 0			6 4													30 0		1 0		1 0		68	60	8	11.8	13	92
93										9 1	18 4							1 0						64 3		13 2			111	97	14	12.6	7	93
94		3 0								5 0	1 0				1 0	1 0		2 0						15 0		2 0			40	40	0	0.0	15	94
95				1 1								1 0													2 0		45 1		54	52	2	3.7	7	95
96										1 0					2 0										1 0				4	2	2	50.0	2	96
97										7 1																	0 1		16	15	1	6.3	6	97
98																							2 0				1 0		2	0	2	100.0	2	98
99										5 3		2 0																	14	11	3	21.4	6	99
100													1 0												2 0				2	2	0	0.0	1	100
101										6 0																			19	16	3	15.8	11	101
102	1 0																												3	3	0	0.0	2	102
103	1 0			3 0	1 1		1 0	0 1	1 5	11 11			1 0		1 0		0 2		1 0		7 2	1 0	1 0		2 3		0 1	1 2	86	52	34	39.5	25	103
104	2 4	4 2	12 5	7 6	3 0		1 0	1 1	1 5	4 5	3 4	0 2	1 0	7 0	1 6	0 2		3 9	2 0	10 0	1 1	5 1		2 0	8 4	4 2	1		2 0	329	185	144	43.8	45	104
105											2 0				1 5					13 2									65	33	32	49.2	6	105
	65	99	222	64	76	13	7	79	5	783	136	15	152	63	86	232	32	89	25	105	147	22	36	108	89	77	84	13	5313					
	59	84	200	48	70	12	6	71	5	618	109	10	149	50	56	208	26	53	25	101	136	21	36	100	75	70	74	13	....	4486				
	6	15	22	16	6	1	1	8	0	165	30	5	3	13	30	24	6	36	0	4	11	1	0	8	14	7	10	0	....	....	827	....		
	9.2	15.2	9.9	25.0	7.9	7.7	14.3	10.1	0.0	21.1	22.1	33.3	2.0	20.6	34.9	10.3	18.7	40.4	0.0	3.8	7.5	4.5	0.0	7.4	15.7	9.1	11.9	0.0	....	....	....	15.6		
	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Alaska P	2 Alaska F	3 Arizona P	3 Arizona F	4 Arkansas P	4 Arkansas F	5 California P	5 California F	6 Colorado P	6 Colorado F	7 Connecticut P	7 Connecticut F	8 Delaware P	8 Delaware F	9 District of Columbia P	9 District of Columbia F	10 Florida P	10 Florida F	11 Georgia P	11 Georgia F	12 Idaho P	12 Idaho F	13 Illinois P	13 Illinois F	14 Indiana P	14 Indiana F	15 Iowa P	15 Iowa F	16 Kansas P	16 Kansas F	17 Kentucky P	17 Kentucky F	18 Louisiana P	18 Louisiana F	19 Maine P	19 Maine F	20 Maryland P	20 Maryland F	21 Massachusetts P	21 Massachusetts F	22 Michigan P	22 Michigan F	Marginal Number
	ALABAMA																																													
1	Birmingham Medical College	17	25																	1	2	12	2																								1
2	University of Alabama, School of Medicine	10	1																																	2	1										2
	ARKANSAS																																													
3	University of Arkansas, Medical Dept.							21	1																																						3
	CALIFORNIA																																													
4	California Eclectic Medical College.—E.							1	0	6	6																																			4
5	College of Medical Evangelists									9	0																																			5
6	College of Physicians and Surgeons, Los Angeles					1	0			25	3																																			6
7	College of Physicians and Surgeons, San Francisco					0	1			3	1																																			7
8	Hahnemann Medical College of the Pacific.—H.									7	0																																			8
9	Leland Stanford Junior Univ., School of Medicine									14	0																																			9
10	Oakland College of Medicine and Surgery									5	1																																			10
11	University of California Medical School									14	0																																			11
	COLORADO																																													
12	University of Colorado, School of Medicine											7	0											1	0																					12
	CONNECTICUT																																													
13	Yale University, School of Medicine													4	0																													1	0		13
	DISTRICT OF COLUMBIA																																													
14	Georgetown University, School of Medicine																	14	0							1	0													2	0	4	2			14
15	George Washington University Medical School																	15	2																		12	0							15
16	Howard University, School of Medicine																	9	5			1	0			0	1	1	0			3	0			12	1			4	3					16
	GEORGIA																																													
17	Atlanta Medical College	10	2																	15	2	115	2																			1	0			17
18	Georgia College of Eclectic Med. and Surg.—E.							2	0													1	0									1	0											18
19	University of Georgia, Medical Department			1	0															0	2	12	0																					19
	ILLINOIS																																													
20	Bennett Medical College																			0	1	2	1			64	16			1	0	1	0							0	1					20
21	Chicago College of Medicine and Surgery	3	2					1	0	0	1							1	0			1	1			77	16	1	0	11	0					1	1			1	1	3	0	2	0	21
22	Chicago Hospital College of Medicine																									2	3																			22
23	Hahnemann Medical College and Hospital.—H.											1	0							2	0					20	4			1	0													23
24	Jenner Medical College																									21	1																			24
25	Northwestern University Medical School									1	0															84	1	1	0	6	0	1	0											25
26	Rush Medical College					1	0			2	0											1	0	1	0	75	0	2	0	2	0	1	0			1	0					1	0		26
27	University of Illinois, College of Medicine					1	0			1	0											1	0	2	0	87	2	0	1	6	0											1	0		27
	INDIANA																																													
28	Indiana University, School of Medicine																											27	0	1	0			1	0										28
	IOWA																																													
29	State University of Iowa, College of Medicine									1	0															1	0			23	0													29
30	State Univ. of Iowa, Coll. of Homeo. Med.—H.																													2	0													30
	KANSAS																															11	0							1	0			31
	KENTUCKY																																	55	3									32
32	University of Louisville, Medical Department	1	0									1	0							3	0	1	0			1	1	7	0											0	1					
	LOUISIANA																																			52	3									
33	Tulane University of Louisiana, School of Med.	7	0							1	0			1	0					4	0																									33
	MAINE																																					22	1			4	1			
34	Bowdoin Medical School																																													34
	MARYLAND																																													
35	College of Physicians and Surgeons of Baltimore													1	0					1	0																	2	0	13	5	5	2			35
36	Johns Hopkins University, Medical Department	1	0							1	0			4	0			4	0	1	0	2	0			2	0	1	0	1	0									36	0	7	0			36
37	University of Maryland, School of Medicine													1	0											2	0											1	0	42	5	2	1			37
	MASSACHUSETTS																																													
38	Boston University, School of Medicine.—H.																															1	0					2	0			13	0			38
39	College of Physicians and Surgeons, Boston													0	1					3	0																	6	1			5	3			39
40	Medical School of Harvard University									1	1			4	1											4	0	1	0	3	0							8	0	1	1	48	0			40
41	Tufts College Medical School													1	0							1	0			1	0			1	0							4	1			63	9			41
	MICHIGAN																																													
42	Detroit College of Medicine and Surgery																																										45	2		42
43	University of Michigan Medical School	1	0																									1	0											1	0	40	1		43
44	University of Michigan, Homeo. Med. School.—H.																																									17	3		44
	MINNESOTA																															1	0													
45	University of Minnesota Medical School																																												45
	MISSOURI																																													
46	Eclectic Medical University.—E.							17	1																																					46
47	Kansas City Hahnemann Medical College.—H.																															1	1													47
48	National University of Arts and Sciences																									2	2			1	0													48
49	St. Louis College of Physicians and Surgeons																																	0	1										49
50	St. Louis University, School of Medicine	1	0					1	0																	3	1			2	0			1	0					1	0			50
51	Washington University Medical School																									2	0																	51
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

H.—Homeopathic; E.—Eclectic; P.—Passed; F.—Failed.

| Marginal Number | 23 Minnesota | | 24 Mississippi | | 25 Missouri | | 26 Montana | | 27 Nebraska | | 28 Nevada | | 29 New Hampshire | | 30 New Jersey | | 31 New Mexico | | 32 New York | | 33 North Carolina | | 34 North Dakota | | 35 Ohio | | 36 Oklahoma | | 37 Oregon | | 38 Pennsylvania | | 39 Rhode Island | | 40 South Carolina | | 41 South Dakota | | 42 Tennessee | | 43 Texas | | 44 Utah | | 45 Vermont | | 46 Virginia | | 47 Washington | | 48 West Virginia | | 49 Wisconsin | | 50 Wyoming | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Ex. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 District of Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	NEBRASKA																																												
52	Lincoln Medical College.—E.																																											52
53	John A. Creighton Medical College											4	0													2	0			2	0	1	0											53
54	University of Nebraska, College of Medicine																									1	0					1	0											54
	NEW HAMPSHIRE																																											
55	Dartmouth Medical School													1	0																							1	0							55
	NEW YORK																																											
56	Albany Medical College													2	0																									1	0					56
57	Columbia University, Coll. of Phys. and Surgs.	1	0							1	0	1	0	5	0																							1	0					57
58	Cornell University Medical College									1	0			0	1																							1	0					58
59	Fordham University, School of Medicine																	1	1							1	0											1	0					59
60	Long Island College Hospital																																					1	0					60
61	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.							1	0			2	0			3	0	2	0	0	1																	2	0	2	0	1	0	61
62	N. Y. Medical College and Hosp. for Women.—H.																																											62
63	Syracuse University, College of Medicine															1	0																													63
64	University and Bellevue Hospital Med. Col.													1	0																													64
65	University of Buffalo, Medical Department																																											65
	NORTH CAROLINA																																											
66	Leonard Medical School	1	0																	0	1																							66
67	North Carolina Medical College																																											67
	OHIO																																											
68	Eclectic Medical College.—E.							1	0																																	1	0	68
69	Ohio State University, College of Medicine																																											69
70	Ohio State University, Coll. of Homeo. Med.—H.																																											70
71	University of Cincinnati, College of Medicine																																											71
72	Western Reserve University, School of Medicine	1	0																									1	0															72
	OKLAHOMA																																											
73	University of Oklahoma, School of Medicine							0	1																							4	0											73
	OREGON																																											
74	University of Oregon, Department of Medicine																																	1	0							1	0	74
	PENNSYLVANIA																																											
75	Hahnemann Medical College and Hospital.—H.															3	0																													75
76	Jefferson Medical College									7	0			3	0	3	0			2	0	2	0	1	0			1	0	1	0	1	0	1	0					1	0	3	1			76
77	Medico-Chirurgical College of Philadelphia	1	0							1	0			1	1	2	0																							1	0					77
78	Temple University, Department of Medicine																																							2	0	3	0			78
79	University of Pennsylvania, School of Medicine	1	0							1	0											2	0	1	0											1	0	1	0	2	0	3	0	79
80	University of Pittsburgh, School of Medicine											0	1																													1	0	80
81	Woman's Medical College of Pennsylvania									1	0																													2	0					81
	SOUTH CAROLINA																																												
82	Medical College of the State of South Carolina																			1	0																							82
	TENNESSEE																																	2	0									
83	Lincoln Memorial University, Medical Dept.																																											83
84	Meharry Medical College	3	1					2	2	0	1			0	1			0	1	4	3	17	7			3	2					0	1	5	0	1	1							84
85	University of Tennessee, College of Medicine	5	1					14	0											1	0	1	0													3	4	1	0					85
86	Univ. of West Tennessee, Coll. of Med. and Surg.																			0	1																	1	0			0	2			86
87	Vanderbilt University, Medical Department	7	1			0	1	4	1			1	0							1	1	0	1											12	0									87
	TEXAS																																												
88	Baylor University, College of Medicine																																												88
89	Fort Worth School of Medicine																																											89
90	Southern Methodist University, Medical Dept.																																												90
91	University of Texas, Department of Medicine																									1	0																			91
	VERMONT																																												
92	University of Vermont, College of Medicine													6	2			1	0	1	0			1	0	1	0													4	1	1	0	92
	VIRGINIA																																												
93	Medical College of Virginia																																	1	0					0	3					93
94	University of Virginia, Department of Medicine	1	0							1	0															1	0													2	0	1	0			94
	WISCONSIN																																												
95	Marquette University, School of Medicine									1	0													1	0	1	0																	95
	CANADA																																												
96	Laval University, Faculty of Medicine																																							1	1			96
97	McGill University, Faculty of Medicine									1	0																													2	0			97
98	Montreal School of Medicine and Surgery																																							0	1			98
99	Queen's University, Faculty of Medicine																													1	0													99
100	University of Manitoba, Manitoba Med. Coll.																																												100
101	University of Toronto, Faculty of Medicine																													1	0					1	0	0	1			2	0	101
102	Western University, Faculty of Medicine																																									2	0	102
103	Foreign Colleges									2	1	0	1	0	1			0	1							2	2	0	1							1	0	1	0					103
104	Miscellaneous Medical Colleges	1	0					1	0	18	18			0	3			0	1	2	4	1	0	1	0	1	0					0	2	3	2	2	5	0	1	1	7	6	8			104
	Totals by States	112		1		7		71		160		17		49		11		57		59		187		9		467		46		66		32		88		85		59		135		223		123		
	Totals—Examined—Passed	73		1		4		66		127		15		38		11		45		42		173		9		414		44		66		28		82		69		54		108		193		117		
	Totals—Examined—Failed	39		0		3		5		33		2		11		0		12		17		14		0		53		2		0		4		6		16		5		27		32		6		
	Percentage of Failures	34.8		0.0		42.9		7.0		20.6		11.8		2.0		0.0		21.1		28.8		7.5		0.0		11.3		4.3		0.0		12.5		6.8		18.8		8.5		20.0		14.2		4.9		
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H.—Homeopathic; E.—Eclectic; P.—Passed; F.—Failed.

| Marginal Number | 23 Minnesota | | 24 Mississippi | | 25 Missouri | | 26 Montana | | 27 Nebraska | | 28 Nevada | | 29 New Hampshire | | 30 New Jersey | | 31 New Mexico | | 32 New York | | 33 North Carolina | | 34 North Dakota | | 35 Ohio | | 36 Oklahoma | | 37 Oregon | | 38 Pennsylvania | | 39 Rhode Island | | 40 South Carolina | | 41 South Dakota | | 42 Tennessee | | 43 Texas | | 44 Utah | | 45 Vermont | | 46 Virginia | | 47 Washington | | 48 West Virginia | | 49 Wisconsin | | 50 Wyoming | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Ex. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	Graduates of All Years					Graduates of 1911-1915					Graduates of 1910 and Previous					Graduates of 1915					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	ALABAMA																					
1	Birmingham Medical College	72	40	32	44.4	7	72	40	32	44.4	7	.....	.....	.....	.....	.....	43	25	18	42.0	7	1
2	University of Alabama, School of Medicine	16	14	2	12.5	3	14	12	2	14.3	2	2	2	0	0.0	2	11	10	1	9.1	1	2
	ARKANSAS																					
3	University of Arkansas, Medical Dept.	27	24	3	11.1	3	27	24	3	11.1	3	.....	.....	.....	.....	.....	19	19	0	0.0	1	3
	CALIFORNIA																					
4	California Eclectic Medical College.—E.	23	16	7	30.4	5	23	16	7	30.4	5	.....	.....	.....	.....	.....	12	7	5	41.7	2	4
5	College of Medical Evangelists	10	9	1	10.0	2	10	9	1	10.0	2	.....	.....	.....	.....	.....	7	7	0	0.0	1	5
6	College of Physicians and Surgeons, Los Angeles	31	28	3	9.7	4	31	28	3	9.7	4	.....	.....	.....	.....	.....	21	21	0	0.0	1	6
7	College of Physicians and Surgeons, San Francisco	12	9	3	25.0	5	10	7	3	30.0	4	2	2	0	0.0	2	2	1	1	50.0	1	7
8	Hahnemann Medical College of the Pacific.—H.	9	9	0	0.0	3	9	9	0	0.0	3	.....	.....	.....	.....	.....	5	5	0	0.0	1	8
9	Leland Stanford Junior Univ., School of Medicine	14	14	0	0.0	1	14	14	0	0.0	1	.....	.....	.....	.....	.....	14	14	0	0.0	1	9
10	Oakland College of Medicine and Surgery	6	5	1	16.7	1	6	5	1	16.7	1	.....	.....	.....	.....	.....	4	4	0	0.0	1	10
11	University of California Medical School	16	15	1	6.3	3	14	14	0	0.0	1	2	1	1	50.0	2	12	12	0	0.0	1	11
	COLORADO																					
12	University of Colorado, School of Medicine	13	13	0	0.0	5	13	13	0	0.0	5	.....	.....	.....	.....	.....	6	6	0	0.0	1	12
	CONNECTICUT																					
13	Yale University, School of Medicine	10	10	0	0.0	6	8	8	0	0.0	4	2	2	0	0.0	2	3	3	0	0.0	1	13
	DISTRICT OF COLUMBIA																					
14	Georgetown University, School of Medicine	34	30	4	11.8	9	33	29	4	12.1	8	1	1	0	0.0	1	14	14	0	0.0	5	14
15	George Washington University Medical School	38	33	5	13.2	12	31	27	4	12.9	8	7	6	1	14.3	6	23	19	4	17.4	5	15
16	Howard University, School of Medicine	46	33	13	28.3	13	45	33	12	26.7	13	1	0	1	100.0	1	8	8	0	0.0	5	16
	GEORGIA																					
17	Atlanta Medical College	172	157	15	8.7	11	172	157	15	8.7	11	.....	.....	.....	.....	.....	158	148	10	6.3	10	17
18	Georgia College of Eclectic Med. and Surg.—E.	6	5	1	16.7	5	6	5	1	16.7	5	.....	.....	.....	.....	.....	1	1	0	0.0	1	18
19	University of Georgia, Medical Department	18	14	4	22.2	6	17	14	3	17.7	5	1	0	1	100.0	1	14	13	1	7.2	3	19
	ILLINOIS																					
20	Bennett Medical College	119	96	23	19.3	15	114	92	22	19.3	15	5	4	1	20.0	3	79	68	11	13.9	9	20
21	Chicago College of Medicine and Surgery	182	140	42	23.1	29	179	139	40	22.3	29	3	1	2	66.7	3	116	96	20	17.2	20	21
22	Chicago Hospital College of Medicine	6	2	4	66.7	2	6	2	4	66.7	2	.....	.....	.....	.....	.....	8	5	3	37.5	3	22
23	Hahnemann Medical College and Hospital.—H.	47	39	8	17.0	13	30	26	4	13.3	6	17	13	4	23.5	9	20	17	3	15.0	4	23
24	Jenner Medical College	24	22	2	8.3	2	22	21	1	4.5	1	2	1	1	50.0	1	19	19	0	0.0	1	24
25	Northwestern University Medical School	57	55	2	3.5	10	51	50	1	2.0	10	6	5	1	16.7	4	33	33	0	0.0	4	25
26	Rush Medical College	146	143	3	2.1	28	128	128	0	0.0	24	18	15	3	16.7	11	86	86	0	0.0	14	26
27	University of Illinois, College of Medicine	138	129	9	6.5	18	130	124	6	4.6	18	8	5	3	37.5	5	99	98	1	1.0	9	27
	INDIANA																					
28	Indiana University, School of Medicine	34	33	1	2.9	8	31	31	0	0.0	5	3	2	1	33.3	3	28	28	0	0.0	3	28
	IOWA																					
29	State University of Iowa, College of Medicine	30	29	1	3.3	7	25	25	0	0.0	3	5	4	1	20.0	5	24	24	0	0.0	2	29
30	State Univ. of Iowa, Coll. of Homeo. Med.—H.	3	3	0	0.0	2	2	2	0	0.0	1	1	1	0	0.0	1	2	2	0	0.0	1	30
	KANSAS																					
31	University of Kansas, School of Medicine	17	16	1	5.9	5	16	16	0	0.0	4	1	0	1	100.0	1	12	12	0	0.0	2	31
	KENTUCKY																					
32	University of Louisville, Medical Department	110	95	15	13.6	25	101	89	12	11.9	22	9	6	3	33.3	6	74	73	1	1.4	14	32
	LOUISIANA																					
33	Tulane University of Louisiana, School of Med.	116	111	5	4.3	15	104	100	4	3.8	11	12	11	1	8.3	8	86	83	3	3.5	6	33
	MAINE																					
34	Bowdoin Medical School	30	28	2	6.7	4	29	27	2	6.9	3	1	1	0	0.0	1	26	25	1	3.8	2	34
	MARYLAND																					
35	College of Physicians and Surgeons of Baltimore	73	58	15	20.5	15	67	54	13	19.3	14	6	4	2	33.3	4	32	29	3	9.4	8	35
36	Johns Hopkins University, Medical Department	114	110	4	3.5	25	102	100	2	2.0	25	12	10	2	16.7	9	50	50	0	0.0	11	36
37	University of Maryland, School of Medicine	86	78	8	9.3	16	83	75	8	9.6	14	3	3	0	0.0	3	58	54	4	6.9	9	37
	MASSACHUSETTS																					
38	Boston University, School of Medicine.—H.	25	24	1	4.0	9	20	20	0	0.0	7	5	4	1	20.0	5	19	19	0	0.0	6	38
39	College of Physicians and Surgeons, Boston	28	17	11	39.3	8	22	15	7	31.8	6	6	2	4	66.7	5	5	5	0	0.0	2	39
40	Medical School of Harvard University	108	101	7	6.5	16	93	88	5	5.4	16	15	13	2	13.3	10	55	54	1	1.8	14	40
41	Tufts College Medical School	104	90	14	13.5	17	93	82	11	11.8	13	11	8	3	27.3	7	59	52	7	11.9	5	41
	MICHIGAN																					
42	Detroit College of Medicine and Surgery	53	49	4	7.5	6	50	46	4	8.0	3	3	3	0	0.0	3	48	46	2	4.2	2	42
43	University of Michigan Medical School	57	55	2	3.5	10	49	48	1	2.0	7	8	7	1	12.5	7	43	42	1	2.3	3	43
44	University of Michigan, Homeo. Med. School.—H.	29	23	6	20.7	5	28	22	6	21.4	5	1	1	0	0.0	1	20	17	3	15.0	1	44
	MINNESOTA																					
45	University of Minnesota Medical School	48	47	1	2.1	7	43	43	0	0.0	5	5	4	1	20.0	4	37	37	0	0.0	3	45
	MISSOURI																					
46	Eclectic Medical University.—E.	23	20	3	13.0	3	19	18	1	5.3	2	4	2	2	50.0	2	16	15	1	6.3	2	46
47	Kansas City Hahnemann Medical College.—H.	6	4	2	33.3	3	5	3	2	40.0	2	1	1	0	0.0	1	4	2	2	50.0	2	47
48	National University of Arts and Sciences	47	44	3	6.4	4	46	43	3	6.5	3	1	1	0	0.0	1	36	36	0	0.0	1	48
49	St. Louis College of Physicians and Surgeons	32	22	10	31.2	9	22	16	6	27.3	5	10	6	4	40.0	6	15	11	4	26.7	5	49
50	St. Louis University, School of Medicine	55	52	3	5.5	16	49	48	1	2.0	13	6	4	2	33.3	3	38	38	0	0.0	6	50
51	Washington University Medical School	35	35	0	0.0	7	30	30	0	0.0	5	5	5	0	0.0	5	26	26	0	0.0	2	51

H.—Homeopathic; E.—Eclectic.

Marginal Number	NAME OF COLLEGE	Graduates of All Years					Graduates of 1911-1915					Graduates of 1910 and Previous					Graduates of 1915					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	NEBRASKA																					
52	Lincoln Medical College.—E.	9	5	4	44.4	2	7	5	2	28.6	1	2	0	2	100.0	2	6	5	1	16.7	1	52
53	John A. Creighton Medical College	62	60	2	3.2	11	60	59	1	1.7	11	2	1	1	50.0	1	45	44	1	2.2	7	53
54	University of Nebraska, College of Medicine	15	15	0	0.0	6	14	14	0	0.0	5	1	1	0	0.0	1	11	11	0	0.0	3	54
	NEW HAMPSHIRE																					
55	Dartmouth Medical School	11	10	1	9.1	8	4	4	0	0.0	4	7	6	1	14.3	5	.....	.....	.....	.....	.....	55
	NEW YORK																					
56	Albany Medical College	81	63	18	22.2	6	78	60	18	23.1	5	3	3	0	0.0	2	34	31	2	8.8	1	56
57	Columbia University, Coll. of Phys. and Surgs.	108	98	10	9.3	18	98	89	9	9.2	12	10	9	1	10.7	7	51	45	6	11.8	7	57
58	Cornell University Medical College	29	27	2	6.9	8	29	27	2	6.9	8	.....	.....	.....	.....	.....	15	14	1	6.7	5	58
59	Fordham University, School of Medicine	58	36	22	37.9	6	58	36	22	37.9	6	.....	.....	.....	.....	.....	27	18	9	33.3	2	59
60	Long Island College Hospital	108	98	10	9.3	5	104	95	9	8.7	4	4	3	1	25.0	3	69	65	4	5.8	1	60
61	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.	88	63	25	28.4	13	88	63	25	28.4	13	.....	.....	.....	.....	.....	41	33	8	19.5	9	61
62	N. Y. Medical College and Hosp. for Women.—H.	7	5	2	28.6	1	7	5	2	28.6	1	.....	.....	.....	.....	.....	4	3	1	25.0	1	62
63	Syracuse University, College of Medicine	24	20	4	16.7	4	22	18	4	18.2	2	2	2	0	0.0	2	9	8	1	11.1	1	63
64	University and Bellevue Hospital Med. Col.	103	99	4	3.9	7	97	93	4	4.1	4	6	6	0	0.0	5	69	67	2	2.9	2	64
65	University of Buffalo, Medical Department	67	61	6	8.9	3	65	60	5	7.7	2	2	1	1	50.0	2	52	50	2	3.8	1	65
	NORTH CAROLINA																					
66	Leonard Medical School	13	9	4	30.8	5	12	8	4	33.3	4	1	1	0	0.0	1	.....	.....	.....	.....	.....	66
67	North Carolina Medical College	32	22	10	31.2	4	30	22	8	26.7	4	2	0	2	100.0	2	21	17	4	19.0	2	67
	OHIO																					
68	Eclectic Medical College.—E.	30	28	2	6.7	8	25	24	1	4.0	6	5	4	1	20.0	3	23	23	0	0.0	4	68
69	Ohio State University, College of Medicine	54	52	2	3.7	5	53	51	2	3.8	4	1	1	0	0.0	1	47	47	0	0.0	2	69
70	Ohio State University, Coll. of Homeo. Med.—H.	20	19	1	5.0	1	20	19	1	5.0	1	.....	.....	.....	.....	.....	20	19	1	5.0	1	70
71	University of Cincinnati, College of Medicine	20	19	1	5.0	2	20	19	1	5.0	2	.....	.....	.....	.....	.....	19	19	0	0.0	1	71
72	Western Reserve University, School of Medicine	37	37	0	0.0	5	36	36	0	0.0	4	1	1	0	0.0	1	33	33	0	0.0	2	72
	OKLAHOMA																					
73	University of Oklahoma, School of Medicine	19	16	3	15.8	4	19	16	3	15.8	4	.....	.....	.....	.....	.....	18	16	2	11.1	3	73
	OREGON																					
74	University of Oregon, Department of Medicine	26	20	6	23.1	5	21	17	4	19.0	4	5	3	2	40.0	3	18	14	4	22.2	3	74
	PENNSYLVANIA																					
75	Hahnemann Medical College and Hospital.—H.	19	19	0	0.0	9	15	15	0	0.0	7	4	4	0	0.0	2	7	7	0	0.0	5	75
76	Jefferson Medical College	167	154	13	7.8	30	158	146	12	7.6	29	9	8	1	11.1	8	41	41	0	0.0	14	76
77	Medico-Chirurgical College of Philadelphia	73	64	9	12.3	15	68	61	7	10.3	13	5	3	2	40.0	5	10	7	3	30.0	6	77
78	Temple University, Department of Medicine	22	18	4	18.2	5	22	18	4	18.2	5	.....	.....	.....	.....	.....	4	4	0	0.0	3	78
79	University of Pennsylvania, School of Medicine	91	85	6	6.6	22	74	73	1	1.4	18	17	12	5	29.4	8	17	17	0	0.0	9	79
80	University of Pittsburgh, School of Medicine	48	44	4	8.3	6	47	44	3	6.4	5	1	0	1	100.0	1	1	1	0	0.0	1	80
81	Woman's Medical College of Pennsylvania	29	27	2	6.9	13	24	22	2	8.3	10	5	5	0	0.0	4	12	11	1	8.3	7	81
	SOUTH CAROLINA																					
82	Medical College of the State of South Carolina	35	27	8	22.9	3	32	27	5	15.6	3	3	0	3	100.0	2	28	26	2	7.1	3	82
	TENNESSEE																					
83	Lincoln Memorial University, Medical Dept.	16	14	2	12.5	4	16	14	2	12.5	4	.....	.....	.....	.....	.....	7	7	0	0.0	4	83
84	Meharry Medical College	137	91	46	33.6	23	128	87	41	32.0	22	9	4	5	55.6	8	91	71	20	22.0	15	84
85	University of Tennessee, College of Medicine	80	65	15	18.7	13	76	62	13	17.1	11	4	2	2	50.0	4	48	43	5	10.4	7	85
86	Univ. of West Tennessee, Coll. of Med. and Surg.	42	25	17	40.5	8	42	25	17	40.5	8	.....	.....	.....	.....	.....	18	11	7	38.9	5	86
87	Vanderbilt University, Medical Department	92	83	9	9.8	18	82	76	6	7.3	14	10	7	3	30.0	8	62	59	3	4.8	12	87
	TEXAS																					
88	Baylor University, College of Medicine	20	20	0	0.0	3	20	20	0	0.0	3	.....	.....	.....	.....	.....	19	19	0	0.0	3	88
89	Fort Worth School of Medicine	13	12	1	7.7	2	12	11	1	8.3	1	1	1	0	0.0	1	11	11	0	0.0	1	89
90	Southern Methodist University, Medical Dept.	6	6	0	0.0	2	6	6	0	0.0	2	.....	.....	.....	.....	.....	1	1	0	0.0	1	90
91	University of Texas, Department of Medicine	34	34	0	0.0	3	34	34	0	0.0	3	.....	.....	.....	.....	.....	29	29	0	0.0	1	91
	VERMONT																					
92	University of Vermont, College of Medicine	68	60	8	11.8	13	57	51	6	10.5	11	11	9	2	18.2	6	30	29	1	3.3	5	92
	VIRGINIA																					
93	Medical College of Virginia	111	97	14	12.6	7	111	97	14	12.6	7	.....	.....	.....	.....	.....	90	79	11	12.2	7	93
94	University of Virginia, Department of Medicine	40	40	0	0.0	15	32	32	0	0.0	12	8	8	0	0.0	6	19	19	0	0.0	5	94
	WISCONSIN																					
95	Marquette University, School of Medicine	54	52	2	3.7	7	54	52	2	3.7	7	.....	.....	.....	.....	.....	46	46	0	0.0	3	95
	CANADA																					
96	Laval University, Faculty of Medicine	4	2	2	50.0	2	2	1	1	50.0	1	2	1	1	50.0	2	2	1	1	50.0	1	96
97	McGill University, Faculty of Medicine	16	15	1	6.3	6	10	10	0	0.0	5	6	5	1	16.7	4	2	2	0	0.0	1	97
98	Montreal School of Medicine and Surgery	2	0	2	100.0	2	2	0	2	100.0	2	.....	.....	.....	.....	.....	1	0	1	100.0	1	98
99	Queen's University, Faculty of Medicine	14	11	3	21.4	6	10	7	3	30.0	4	4	4	0	0.0	4	2	1	1	50.0	1	99
100	University of Manitoba, Manitoba Med. Coll.	2	2	0	0.0	1	2	2	0	0.0	1	.....	.....	.....	.....	.....	2	2	0	0.0	1	100
101	University of Toronto, Faculty of Medicine	19	16	3	15.8	11	9	8	1	11.1	6	10	8	2	20.0	7	3	2	1	33.3	3	101
102	Western University, Faculty of Medicine	3	3	0	0.0	2	3	3	0	0.0	2	.....	.....	.....	.....	.....	1	1	0	0.0	1	102
103	Foreign Colleges	86	52	34	39.5	26	29	15	14	48.3	15	57	37	20	35.1	21	.....	.....	.....	.....	.....	103
104	Miscellaneous Medical Colleges	329	185	144	43.8	45	139	67	72	51.8	35	190	118	72	37.9	38	6	6	0	0.0	2	104
105	Undergraduates	65	32	32	49.2	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	105
	Totals	5313	4486	827	15.6	....	4627	4014	613	13.2	....	621	439	182	29.2	...	2892	2674	218	7.5	....	

H.—Homeopathic; E.—Eclectic.

TABLE D.—NONRECOGNITION OF MEDICAL COLLEGES

This Table, Based on Official Reports, Shows the Numerous Pitfalls to be Avoided by Prospective Medical Students

The meaning of the letters (**a, b, c, d, x**) is given in the footnotes.

Marginal Number	COLLEGE	Classification by Council on Medical Education†	1 Alabama	2 Alaska	3 Arizona	4 Arkansas	5 California	6 Colorado	7 Connecticut	8 Delaware	9 Dist. of Columbia	10 Florida	11 Georgia	12 Idaho	13 Illinois	14 Indiana	15 Iowa	16 Kansas	17 Kentucky	18 Louisiana	19 Maine	20 Maryland	21 Massachusetts	22 Michigan	23 Minnesota	24 Mississippi	25 Missouri	26 Montana	27 Nebraska	28 Nevada	29 New Hampshire	30 New Jersey	31 New Mexico	32 New York	33 North Carolina	34 North Dakota	35 Ohio	36 Oklahoma	37 Oregon	38 Pennsylvania	39 Rhode Island	40 South Carolina	41 South Dakota	42 Tennessee	43 Texas	44 Utah	45 Vermont	46 Virginia	47 Washington	48 West Virginia	49 Wisconsin	50 Wyoming	51 Porto Rico	Reported Nonrecognition by State Licensing Boards: No. of State Boards apparently giving full recognition	No. of State Boards reporting college not fully recognized	Percentage of State Boards granting full recognition	Marginal Number
1	University of Alabama, School of Medicine	A																																																											1
2	University of Arkansas, Medical Department	B	b					a		x						b	b							b							x	b					b	x	b		x	x		e				x			b				51	..	100	1
3	College of Physicians and Surgeons, San Francisco	C	x			x		x	x	x		x	x		x	b	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		b			35	16	69	2
4	Leland Stanford Junior Univ., School of Medicine	A																													x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	17	34	33	3
5	University of California Medical School	A																																																							51	..	100	4
6	College of Physicians and Surgeons, Los Angeles	B																																																							51	..	100	5
7	Oakland College of Medicine and Surgery	B	b					a		x						b	b							x							x							x																		45	6	88	6
8	College of Medical Evangelists	C	x			x		x	x	x		x	x		x		x		x	x	x	x		x	b	x					x	x	x	x	x	x	x	b	x		x	e					x			b				34	17	67	7
9	University of Colorado, School of Medicine	A																													x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	18	33	35	8
10	Yale University, School of Medicine	A																																																							51	..	100	9
11	George Washington University, Medical School	A																																																							51	..	100	10
12	Georgetown University, School of Medicine	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	11
13	Howard University, School of Medicine	A																																																					51	..	100	12
14	Atlanta Medical College	A																																																					51	..	100	13
15	Georgia College of Eclectic Medicine and Surgery	C	b					a								b	b		x					b							b	b				b		b						e				b			b				37	14	73	14
16	University of Georgia, Medical Department	A	x					x		x			x		x	b	x		x	x	x	x		x	x	x					x	x		x	x	x	x	x	x		x	x	e				x	x		x		x		x	21	30	41	15
17	Bennett Medical College	B	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	16
18	Chicago College of Medicine and Surgery	B	b					x		x						b	b		x					b							x	x				b	x	b		x	x		e				x			x				32	19	63	17
19	Chicago Hospital College of Medicine	B	b					a		x						b	b		x					b							x	x				b	x	b		x	x		e				x			x				32	19	63	18
20	Hahnemann Medical College and Hospital, Chicago	C	x			x		x	x	x		x	x		x	x	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	18	33	35	19
21	Jenner Medical College, Chicago	B	b					a		x						b	b							b							x	x				b		b						e				b			b				36	15	71	20
22	Northwestern University Medical School	C	x			x		x	x	x		x	x		x	x	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	18	33	35	21
23	Rush Medical College (University of Chicago)	A																																																				51	..	100	22
24	University of Illinois, College of Medicine	A																																																				51	..	100	23
25	Indiana University, School of Medicine	A																																																				51	..	100	24
26	State University of Iowa, College of Medicine	A																																																				51	..	100	25
27	State University of Iowa, College of Homeo. Med.	A																																																				51	..	100	26
28	University of Kansas, School of Medicine	A																																																				51	..	100	27
29	University of Louisville, Medical Department	A	b					a								b	b							b							b	b				b		b		x				e				b			b				50	1	98	28
30	Tulane University School of Medicine	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	29
31	Bowdoin Medical School	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	30
32	Johns Hopkins University, Medical Department	A																																																				51	..	100	31
33	Univ. of Md., School of Med. and Coll. of P. & S.	A																																																				51	..	100	32
34	Boston University, School of Medicine	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	33
35	College of Physicians and Surgeons, Boston	C																																																					51	..	100	34
36	Medical School of Harvard University	A	x			x		x	x	x		x	x		x	x	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	17	34	33	35
37	Tufts College Medical School	A																																																				51	..	100	36
38	Detroit College of Medicine and Surgery	A	b					a								b	b							b							b	b				b		b		x				e				b			b				38	13	75	37
39	University of Michigan Medical School	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	38
40	University of Michigan, Homeopathic Medical School	A																																																				51	..	100	39
41	University of Minnesota Medical School	A																																																				51	..	100	40
42	University of Mississippi, Department of Medicine*	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	41
43	University of Missouri, School of Medicine*	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	42
44	Southwest School of Medicine and Hospital	C	x			x		x	x	x		x	x		x	b	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	20	31	39	43
45	Eclectic Medical University, Kansas City	C	x			x		x	x	x		x	x		x	x	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	19	32	37	44
46	National University of Arts and Sciences, Med. Dept.	C	x			x		x	x	x		x	x		x	b	x		x	x	x	x		x	x	x					x	x	x	x	x	x	x	x	x		x	x	e				x	x		x		x		x	17	34	33	45
47	St. Louis University, School of Medicine	A	b					a								b	b							b							b	b				b		b						e				b			b				39	12	77	46

| | | |

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this result. Justice to such candidates, who have been licensed, but who, for good reasons, desire to change their locations, is the strongest argument for interstate reciprocity in medical licensure, or for special percentage allowances at the examinations for years of practice. The total number of these candidates is diminishing each year as increased reciprocal relations are established. As a rule, the states which do not have reciprocal relations with other states (as Florida, Montana, Massachusetts, Oregon, Washington, see Table 1) examined the largest number of old practitioners.

GRADUATES OF 1915 EXAMINED DURING 1915

Table C also gives the results for the graduates of 1915 who were examined during the year by the state boards, and shows that 2,892, or 54.4 per cent., of all candidates examined during the year graduated in 1915, including 13 who graduated from Canadian medical colleges. Educational statistics show that the medical colleges of the United States graduated 3,536 students last year; therefore, 81.4 per cent. of all graduates in 1915 took examinations for license during that year. In some of the states graduates in medicine are allowed to serve as hospital interns without first becoming licensed practitioners, which doubtless accounts for some of the remaining 18.6 per cent. Of the 1915 graduates examined, 218, or 7.5 per cent., failed.

TABLE E.—COLLEGES GROUPED BY STATES
Showing the Number Examined and Percentage of Failures

All Colleges of	Graduates: Of All Years Number Examined	Of All Years Per Cent. Failed	Of 1911 to 1915 Number Examined	Of 1911 to 1915 Per Cent. Failed	Of 1910 & Prev. Number Examined	Of 1910 & Prev. Per Cent. Failed	Of 1915 Number Examined	Of 1915 Per Cent. Failed	State Rank According to the Number Examined	Rank According to Successes at Examinations
Alabama	88	38.6	86	39.5	2	0.0	54	35.1	16	31
Arkansas	27	11.1	27	11.1	.....	.....	19	0.0	27	19
California	121	13.2	117	12.8	4	25.0	77	7.6	12	23
Colorado	13	0.0	13	0.0	.....	.....	6	0.0	31	1
Connecticut	10	0.0	8	0.0	2	0.0	3	0.0	33	1
Dist. of Columbia	118	28.8	109	18.3	9	22.2	45	8.8	13	29
Georgia	196	10.2	195	9.7	1	100.0	173	6.3	8	17
Illinois	719	12.9	660	10.9	59	25.4	460	8.3	1	22
Indiana	34	2.9	31	0.0	3	33.3	28	0.0	24	5
Iowa	33	3.0	27	0.0	6	16.7	26	0.0	25	6
Kansas	17	5.9	16	0.0	1	100.0	12	0.0	30	9
Kentucky	110	13.6	101	11.9	9	33.3	74	1.4	15	24
Louisiana	116	4.3	104	3.8	12	8.3	86	3.5	14	8
Maine	30	6.7	29	6.9	1	0.0	26	3.8	26	10
Maryland	273	9.9	252	9.1	21	19.0	140	5.0	5	16
Massachusetts	265	12.5	228	10.0	37	27.0	138	5.8	6	21
Michigan	139	8.6	127	8.7	12	8.3	111	5.4	11	13
Minnesota	48	2.1	43	0.0	5	20.0	37	0.0	21	4
Missouri	198	10.6	171	7.6	27	29.6	135	5.2	7	18
Nebraska	86	7.0	81	3.7	5	60.0	62	3.2	17	11
New Hampshire	11	9.1	4	0.0	7	14.3	.....	.....	32	14
New York	673	1.5	646	15.5	27	11.1	371	9.9	2	3
North Carolina	45	31.1	42	28.6	3	66.7	21	19.0	22	30
Ohio	161	3.7	154	3.2	7	14.3	142	0.7	9	7
Oklahoma	19	15.8	19	15.8	.....	.....	18	11.1	29	25
Oregon	26	23.1	21	19.0	5	40.0	18	22.2	28	27
Pennsylvania	449	8.5	408	7.1	41	22.0	92	4.3	3	12
South Carolina	35	22.9	32	15.6	3	100.0	28	7.1	23	26
Tennessee	367	24.3	344	23.0	23	34.8	226	15.6	4	28
Texas	73	1.4	72	1.4	1	0.0	60	0.0	18	2
Vermont	68	11.8	57	10.5	11	18.2	30	3.3	19	20
Virginia	151	9.3	143	9.8	8	0.0	109	10.1	10	15
Wisconsin	54	3.7	54	3.7	.....	.....	46	0.0	20	7
Totals Ex. in 1915	4773	17.3	4421	11.8	352	24.4	2892	7.5	....	....

This table gives data relating to the group of colleges in each state. For example, it shows that, of all the medical schools in Illinois, 719 graduates of various years were examined by state boards during 1915, and of this number, 12.9 per cent. failed. Of the 660 who graduated in recent years (1911 to 1915 inclusive), 10.9 per cent. failed; of the 59 who graduated previous to 1911, 25.4 per cent. failed, and of the 460 graduates of 1915, 8.3 per cent. failed.

The ninth column gives the rank of each state group of colleges according to the number of graduates examined. The Illinois group of colleges leads, having 719 graduates examined by state boards during 1915, followed by New York with 673, Pennsylvania with 449, Tennessee with 367, Maryland with 273 and Massachusetts with 265.

The tenth column gives the rank of each state group of colleges according to the success of the graduates at the examinations. It is interesting to compare the figures of these two last columns. While the Illinois group ranks first according to the number examined it ranks twenty-second in the success of its graduates at the examinations. While Pennsylvania ranks third as to the number examined, it ranks twelfth in the success of its graduates at the examinations, and while Tennessee ranks fourth as to the number examined, it ranks as the twenty-eighth in the success of its graduates at the examinations.

TOTAL RESULTS
Comparison with Previous Years

Year	Table A: Total Examined	Examined—Passed	Examined—Failed	Percentage Failed	B: Recent Grads. Examined	Percentage Failed	C: Older Prac. Examined	Percentage Failed	A: Nongrads Examined	Percentage Failed	I: Registered without Written Examination	Total Registered
1904	7035	5672	1363	19.3	4773	14.1	579	29.7	515	52.6	999	6671
1905	7170	5680	1490	20.8	6054	16.2	690	37.7	472	61.9	394	6074
1906	8035	6368	1667	20.7	6250	16.4	793	27.1	703	51.3	1497	7865
1907	7271	5723	1548	21.3	5922	15.1	675	27.7	674	69.6	1426	7149
1908	7770	6084	1686	21.7	6477	17.8	796	31.5	494	56.8	1276	7360
1909	7287	5857	1430	19.6	5891	15.4	958	30.0	438	54.1	1373	7220
1910	7004	5712	1292	18.4	5678	14.9	973	29.1	353	45.6	1640	7352
1911	6960	5578	1382	19.9	5685	17.2	945	29.4	330	38.5	1246	6824
1912	6879	5466	1413	20.5	5770	18.6	856	29.2	253	34.8	1257	6723
1913	6435	5236	1199	18.6	5390	16.5	225	32.1	251	37.8	1265	6501
1914	5570	4370	1200	21.6	4549	17.6	728	30.0	293	61.4	1427	5797
1915	5313	4486	827	15.6	4627	13.2	621	29.3	65	49.2	1386	5872

RESULTS FOR LARGER COLLEGES
Comparison with Previous Years (Table F)

Year	Colleges Represented	Total Examined	Per Cent. Failed	Colleges, 100 or More Examined	Total Examined	Per Cent. Failed	Colleges, 50 to 100 Examined	Total Examined	Per Cent. Failed	Colleges, Less than 50 Examined	Total Examined	Per Cent. Failed	Foreign, Misc., and Nongrads. Exam'd	Per Cent. Failed
1904	149	6241	16.4	14	2271	11.7	28	1817	16.9	107	2153	21.0	794	43.1
1905	153	6411	18.3	14	2350	12.4	37	2543	17.7	102	1518	28.9	759	51.1
1906	151	6938	17.3	16	2504	14.5	34	2381	16.9	96	2053	21.3	1097	42.5
1907	146	6207	13.8	12	1626	12.7	36	2578	14.7	98	2003	13.6	1064	55.5
1908	137	6491	17.2	19	2566	15.6	26	1825	15.5	92	2070	20.8	1279	14.6
1909	134	6341	16.2	17	2476	16.9	27	1920	12.3	90	1945	19.2	946	42.6
1910	121	5953	15.3	17	2379	13.3	25	1791	13.7	79	1783	19.3	1051	36.5
1911	119	6062	17.2	18	2508	11.0	28	1895	17.1	73	1659	20.1	898	37.6
1912	110	5563	17.1	12	1776	15.6	31	2148	17.3	67	1639	18.5	790	37.0
1913	99	5339	15.2	15	2143	12.6	27	815	37.5	57	1381	17.1	1096	35.2
1914	96	4597	16.6	13	1719	16.5	19	1342	12.5	64	1536	20.2	973	45.0
1915	95	4773	17.3	16	2043	11.5	19	1321	14.5	60	1409	13.1	540	40.9

NONRECOGNITION OF MEDICAL COLLEGES

Table D shows for each college the state in which its diplomas are not given unqualified recognition. Nonrecognition is expressed by different terms in different states. Some boards list colleges as "in good standing" or "not in good standing," some give them as "reputable" or "not reputable"; in New York full recognition is given only to colleges which are "registered," and in Michigan colleges are divided into groups, only those of Group I having full recognition. This table also shows the latest rating given to each college by the Council on Medical Education.

The information given in this table is from official correspondence, and the data have been most carefully verified. From the point of view of the prospective student who may be selecting a medical college, the facts are of extreme importance. The table shows that there are 42 medical colleges which have complete recognition in all states. If the student has completed two or more years' work in a recognized college or university before he gains entrance to a medical college, he may take his choice from among 16 other colleges, a diploma from which would admit him to the license examination in all states but South Dakota; without the two years of premedical collegiate training, however, he will find that his diploma will not enable him to secure a license in twelve states. If he gets his medical training in one of the remaining 38 colleges, he will find on graduation that his diploma is not recognized in from 13 to 35 states.

Without the information published in Table D, these state board statistics would be not merely incomplete—*they would be actually misleading.* For example, 24 graduates of the Jenner Medical College of Chicago were examined during 1915, 2 in California, and 22 in Illinois, and only 2, or 8.3 per cent., failed. The low failure percentage makes this college appear to rank among the best teaching institutions in the country. How different the picture, however, when the facts as set forth in Table D show that the diplomas of this college are not considered an acceptable qualification for the license to practice medicine in thirty-three states!

Thirty-four state licensing boards, to some extent at least, are utilizing their legal power to refuse recognition to medical colleges which do not meet certain educational standards, or which otherwise do not meet the requirements in the respective states. In the other 16 states, however, this table indicates that either the practice acts do not give the boards the right to enforce a requirement of reasonable standards, or else the boards are not exercising their authority in this respect. It is clearly evident that if the graduates of low-standard medical colleges are not eligible for license in the majority of states, they will flock to the other 16 which still grant them recognition. *These 16 states, therefore, will literally be the dumping ground for the output of low-grade medical colleges until the licensing boards obtain the needed legal powers, or until the boards having the authority take action in the matter.*

RECOGNITION OF MEDICAL COLLEGES

(*Based on Table D*)

	Number of Colleges
Recognized by all state boards	42
Not recognized by 1 to 12 state boards	23
Not recognized by 13 to 20 state boards	18
Not recognized by 21 to 35 state boards	13
Total	96

Study of Totals and Percentages

A study of totals and percentages as compared with previous years is of interest. The total examined in 1915—5,313—is the lowest number of candidates examined for license in any year since the compiling of these statistics began. There was a decrease of 257 below the number examined in 1914, 1,122 below the number examined in 1913, and a decrease of 2,522 below 1906, when 8,035 candidates were examined. Statistics regarding physicians licensed in the various states by reciprocity and by other methods are given

TABLE F.—COLLEGES HAVING FIFTY OR MORE EXAMINED

TABLE SHOWS TOTAL NUMBER EXAMINED, TOTAL NUMBER PASSED, TOTAL NUMBER FAILED, PERCENTAGE OF FAILURES AND NUMBER OF STATES IN WHICH EACH COLLEGE HAD REPRESENTATIVES

COLLEGE	Graduates of All Years					Graduates of 1911-1915					Graduates of 1910 and Previous					Graduates of 1915					Marginal Number, Table A
	Number Examined	Number Passed	Number Failed	Per Cent. Failed	No. of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	No. of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	No. of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	No. of States	
Chicago College of Medicine and Surgery	182	140	42	23.1	21	179	139	40	22.3	20	3	1	2	66.7	3	116	96	20	17.2	20	21
Atlanta Medical College	172	157	15	8.7	11	172	157	15	8.7	11	.....	.....	.....	.....	.....	158	148	10	6.3	10	17
Jefferson Medical College	167	154	13	7.8	30	158	146	12	7.6	29	9	8	1	11.1	8	41	41	0	0.0	15	76
Rush Medical College	146	143	3	2.1	28	128	128	0	0.0	24	18	15	3	16.7	11	86	86	0	0.0	14	26
University of Illinois, College of Medicine	138	129	9	6.5	18	130	124	6	4.6	18	8	5	3	37.5	5	99	98	1	1.0	9	27
Meharry Medical College	137	91	46	33.6	23	128	87	41	32.0	22	9	4	5	55.6	8	91	71	20	22.0	15	84
Bennett Medical College	119	96	23	19.3	15	114	92	22	19.3	15	5	4	1	20.0	3	79	68	11	13.9	9	20
Tulane University of Louisiana	116	111	5	4.3	15	104	100	4	3.8	11	12	11	1	8.3	8	86	83	3	3.5	6	33
Johns Hopkins University, Medical Department	114	110	4	3.5	25	102	100	2	2.0	25	12	10	2	16.7	9	50	50	0	0.0	11	36
Medical College of Virginia	111	97	14	12.6	7	111	97	14	12.6	7	.....	.....	.....	.....	.....	90	79	11	12.2	7	03
University of Louisville, Medical Department	110	95	15	13.6	25	101	89	12	11.9	22	9	6	3	33.3	6	74	73	1	1.4	14	32
Medical School of Harvard University	108	101	7	6.5	16	93	88	5	5.4	16	15	13	2	13.3	10	55	54	1	1.8	14	40
Columbia University, Coll. of Phys. and Surgs.	108	98	10	9.3	18	98	89	9	9.2	12	10	9	1	10.7	7	51	45	6	11.8	7	57
Long Island College Hospital	108	98	10	9.3	5	104	95	9	8.7	4	4	3	1	25.0	3	69	65	4	5.8	1	00
Tufts College Medical School	104	90	14	13.5	17	93	82	11	11.8	13	11	8	3	27.3	7	59	52	7	11.9	5	41
University and Bellevue Hospital Medical College	103	99	4	3.9	64	97	93	4	4.1	4	6	6	0	0.0	5	69	67	2	2.9	2	64
Vanderbilt University, Medical Department	92	83	9	9.8	18	82	76	6	7.3	14	10	7	3	30.0	8	62	59	3	4.8	12	87
University of Pennsylvania, School of Medicine	91	85	6	6.6	22	74	73	1	1.4	18	17	12	5	29.4	8	17	17	0	0.0	9	79
New York Homeo. Med. Coll. and Flower Hosp.	88	63	25	28.4	13	88	63	25	28.4	13	.....	.....	.....	.....	.....	41	33	8	19.5	9	61
University of Maryland, School of Medicine	86	78	8	9.3	16	83	75	8	9.6	14	3	3	0	0.0	3	58	54	4	6.9	9	37
Albany Medical College	81	63	18	22.2	6	78	60	18	23.1	5	3	3	0	0.0	3	34	31	3	8.8	1	56
University of Tennessee, College of Medicine	80	65	15	18.7	13	76	63	13	17.1	11	4	2	2	50.0	4	48	43	5	10.4	7	85
College of Physicians and Surgeons, Baltimore	73	58	15	20.5	15	67	54	13	19.3	14	6	4	2	33.3	4	32	29	3	9.4	8	35
Medico-Chirurgical College of Philadelphia	73	64	9	12.3	15	68	61	7	10.3	13	5	3	2	40.0	5	10	7	3	30.0	6	77
Birmingham Medical College	72	40	32	44.4	7	72	40	32	44.4	7	.....	.....	.....	.....	.....	43	25	18	42.0	7	1
University of Vermont, College of Medicine	68	60	8	11.8	13	57	51	6	10.5	11	11	9	2	18.2	6	30	29	1	3.3	5	92
University of Buffalo, Department of Medicine	67	61	6	8.9	3	65	60	5	7.7	2	2	1	1	50.0	2	52	50	2	3.8	1	65
John A. Creighton Medical College	62	60	2	3.2	11	60	59	1	1.7	11	2	1	1	50.0	1	45	44	1	2.2	7	53
Fordham University, School of Medicine	58	36	22	37.9	6	58	36	22	37.9	6	.....	.....	.....	.....	.....	27	18	9	33.3	2	70
Northwestern University Medical School	57	55	2	3.5	25	51	50	1	2.0	16	6	5	1	16.7	4	33	33	0	0.0	4	25
University of Michigan Medical School	57	55	2	3.5	43	49	48	1	2.0	7	8	7	1	12.5	7	48	42	1	2.3	3	43
St. Louis University, School of Medicine	55	52	3	5.5	16	49	48	1	2.0	13	6	4	2	33.3	3	38	38	0	0.0	6	50
Ohio State University, College of Medicine	54	52	2	3.7	5	53	51	2	3.8	4	1	1	0	0.0	1	47	47	0	0.0	2	69
Marquette University, School of Medicine	54	52	2	3.7	7	54	52	2	3.7	7	.....	.....	.....	.....	.....	46	46	0	0.0	3	95
Detroit College of Medicine and Surgery	53	49	4	7.5	6	50	46	4	8.0	3	3	3	0	0.0	3	48	46	2	4.2	2	42
Totals	3364	2940	424	12.6	....	3146	2772	374	11.9	....	218	168	50	22.9	....	2027	1867	160	7.9	....	

This table is especially interesting, since it gives data relating to the 35 larger medical colleges arranged according to the number of graduates examined. This allows of comparison between colleges having classes of nearly equal size. For the third consecutive year the Chicago College of Medicine and Surgery has had the largest number, the position having been held by the College of Physicians and Surgeons of Chicago in 1906, 1907 and 1912. In 1908 Jefferson Medical College had the highest number examined. In 1909, 1910 and 1911 the University of Louisville Medical Department had the largest number examined. The first place from the standpoint of the number examined, however, does not always mean first place from the standpoint of scholarship. Note the percentages of failures.

Of the 16 colleges having 100 or more examined, 10 have failure percentages of less than 10, while six stand out prominently with large failure percentages—12.6, 13.5, 13.6, 19.3, 23.1 and 33.6. These high percentages hold for five of these colleges even in respect to graduates of 1915. The three highest failure percentages are for Meharry Medical College, 33.6; Chicago College of Medicine and Surgery, 23.1, and Bennett Medical College, 19.3.

Of the 19 colleges having between 50 and 100 graduates examined, 11 had failure percentages of less than 10; 3 had failure percentages between 10 and 20, and 5 had failure percentages above 20, the three colleges having the highest failure percentages being Birmingham Medical College, 44.4; Fordham University, School of Medicine, 37.9, and New York Homeopathic Medical College and Flower Hospital, 28.4.

The average percentage of failures for these larger colleges for graduates of 1910 and previous years was 22.9; for graduates of 1911 to 1915 inclusive (recent graduates), 11.9; for graduates of 1915, 7.9, and for graduates of all years, 12.6. Of the 4,773 graduates of the 95 colleges in the United States which had graduates examined by state boards in 1915, these larger (36.8 per cent. of all) schools furnished 3,364, or 70.5 per cent., of the graduates examined.

TABLE G.—COMPARISON OF RESULTS IN HOME STATES AND ELSEWHERE, BASED ON TABLE B

COLLEGES	Total Examined	Results in Home State			Results in Other States		
		Passed	Failed	Per Cent. Failed	Passed	Failed	Per Cent. Failed
ALABAMA —24.9	**36**	**27**	**26**	**49.1**	**25**	**8**	**24.2**
Birmingham Medical College	72	17	25	59.5	23	7	42.5
University of Alabama, School of Med.	14	10	1	9.1	2	1	33.3
ARKANSAS +35.5	**27**	**21**	**1**	**4.5**	**3**	**2**	**40.0**
University of Arkansas, Medical Dept.	27	21	1	4.5	3	2	40.0
CALIFORNIA +5.7	**117**	**83**	**11**	**11.7**	**19**	**4**	**17.4**
California Eclectic Medical College	23	6	6	50.0	10	1	9.1
College of Medical Evangelists	10	9	0	0.0	0	1	100.0
College of Phys. and Surgs., Los Angeles	31	25	3	10.7	3	0	0.0
Coll. of Phys. and Surgs., San Francisco	10	3	1	25.0	4	2	33.3
Hahnemann Med. Coll. of the Pacific	9	7	0	0.0	2	0	0.0
Leland Stanford Junior University	14	14	0	0.0	0	0	0.0
Oakland College of Med. and Surg.	6	5	1	16.7	0	0	0.0
University of California Medical School	14	14	0	0.0	0	0	0.0
COLORADO —	**13**	**7**	**0**	**0.0**	**6**	**0**	**0.0**
University of Colorado	13	7	0	0.0	6	0	0.0
CONNECTICUT —	**8**	**4**	**0**	**0.0**	**4**	**0**	**0.0**
Yale University	8	4	0	0.0	4	0	0.0
DISTRICT OF COLUMBIA +4.7	**103**	**38**	**7**	**15.6**	**51**	**13**	**20.3**
Georgetown University	33	14	0	0.0	15	4	21.1
George Washington University	31	15	2	11.8	12	2	14.3
Howard University	45	9	5	35.7	24	7	22.6
GEORGIA +24.7	**195**	**128**	**2**	**1.5**	**48**	**17**	**26.2**
Atlanta Medical College	172	115	2	1.7	42	13	23.6
Georgia Coll. of Eclectic Med. and Surg.	6	1	0	0.0	4	1	20.0
University of Georgia	17	12	0	0.0	2	3	60.0
ILLINOIS +4.6	**660**	**380**	**43**	**10.2**	**202**	**35**	**14.8**
Bennett Medical College	114	64	16	20.0	28	6	17.6
Chicago College of Med. and Surg.	179	77	16	17.2	62	24	27.9
Chicago Hospital College of Medicine	6	2	3	60.0	0	1	100.0
Hahnemann Medical College and Hosp.	30	20	4	16.7	6	0	0.0
Jenner Medical College	22	21	1	4.5	0	0	0.0
Northwestern University	51	34	1	2.9	16	0	0.0
Rush Medical College	128	75	0	0.0	53	0	0.0
University of Illinois	130	87	2	2.2	37	4	9.8
INDIANA —	**31**	**27**	**0**	**0.0**	**4**	**0**	**0.0**
Indiana University	31	27	0	0.0	4	0	0.0
IOWA —	**27**	**25**	**0**	**0.0**	**2**	**0**	**0.0**
State Univ. of Iowa Coll of Med.	25	23	0	0.0	2	0	0.0
State Univ. of Iowa, Coll. of Homeo. Med.	2	2	0	0.0	0	0	0.0
KANSAS —	**16**	**11**	**0**	**0.0**	**5**	**0**	**0.0**
University of Kansas	16	11	0	0.0	5	0	0.0
KENTUCKY +15.8	**101**	**55**	**3**	**5.2**	**34**	**9**	**21.0**
University of Louisville	101	55	3	5.2	34	9	21.0
LOUISIANA —3.5	**104**	**52**	**3**	**5.5**	**48**	**1**	**2.0**
Tulane University of Louisiana	104	52	3	5.5	48	1	2.0
MAINE +12.4	**29**	**22**	**1**	**4.3**	**5**	**1**	**16.7**
Bowdoin Medical College	29	22	1	4.3	5	1	16.7
MARYLAND —1.3	**252**	**91**	**10**	**9.9**	**138**	**13**	**8.6**
College of Phys. and Surgs., Baltimore	67	13	5	27.8	41	8	16.3
Johns Hopkins University	102	36	0	0.0	64	2	3.0
University of Maryland	83	42	5	10.6	33	3	8.3
MASSACHUSETTS +4.1	**228**	**129**	**12**	**8.5**	**78**	**11**	**12.6**
Boston University	20	13	0	0.0	7	0	0.0
College of Phys. and Surgs., Boston	22	5	3	37.5	10	4	28.6
Medical School of Harvard University	93	48	0	0.0	40	5	11.1
Tufts College Medical School	93	63	9	12.5	19	2	9.5
MICHIGAN +20.7	**127**	**102**	**6**	**5.6**	**14**	**5**	**26.3**
Detroit College of Med. and Surg.	50	45	2	4.3	1	2	66.7
University of Michigan Medical School	49	40	1	2.4	8	0	0.0
Univ. of Michigan, Homeo. Med. School	28	17	3	15.0	5	3	42.9
MINNESOTA —	**43**	**38**	**0**	**0.0**	**5**	**0**	**0.0**
University of Minnesota	43	38	0	0.0	5	0	0.0
MISSOURI +7.3	**171**	**109**	**6**	**5.2**	**49**	**7**	**12.5**
Eclectic Medical University	19	.....	.....	.....	18	1	5.3
Kansas City Hahnemann Med. Coll.	5	2	1	33.3	1	1	50.0
National Univ. of Arts and Sciences	46	40	1	2.4	3	2	40.0
St. Louis College of Phys. and Surgs.	22	11	4	26.7	5	2	28.6
St. Louis University	49	31	0	0.0	17	1	5.6
Washington University	30	25	0	0.0	5	0	0.0
NEBRASKA —5.5	**81**	**52**	**3**	**5.5**	**26**	**0**	**0.0**
Lincoln Medical College	7	5	2	28.6	0	0	0.0
John A. Creighton Medical College	60	38	1	2.6	21	0	0.0
University of Nebraska	14	9	0	0.0	5	0	0.0
NEW HAMPSHIRE —	**4**	**1**	**0**	**0.0**	**3**	**0**	**0.0**
Dartmouth Medical School	4	1	0	0.0	3	0	0.0
NEW YORK —12.0	**646**	**470**	**96**	**17.0**	**76**	**4**	**5.0**
Albany Medical College	78	55	18	24.7	5	0	0.0
Columbia University, Coll. of P. and S.	98	68	9	11.7	21	0	0.0
Cornell University Medical College	29	21	1	4.5	6	1	14.3
Fordham University	58	28	20	41.7	8	2	20.0
Long Island College Hospital	104	92	9	8.9	2	0	0.0
N. Y. Homeo Med. Coll. and Flower Hosp.	88	39	24	38.1	24	1	4.0
N. Y. Med. Coll. and Hosp. for Women	7	5	2	28.6	0	0	0.0
Syracuse University	22	17	4	19.0	1	0	0.0
University and Bellevue Hosp. Med. Coll.	97	86	4	4.4	7	0	0.0
University of Buffalo	65	59	5	7.8	1	0	0.0
NORTH CAROLINA +34.2	**42**	**27**	**8**	**22.9**	**3**	**4**	**57.1**
Leonard Medical School	12	6	2	25.0	2	2	50.0
North Carolina Medical College	30	21	6	22.2	1	2	66.7
OHIO +16.2	**154**	**135**	**2**	**1.5**	**14**	**3**	**17.7**
Eclectic Medical College	23	19	0	0.0	5	1	16.7
Ohio State University, Coll. of Med.	53	46	1	2.1	5	1	16.7
Ohio State Univ., Coll. of Homeo. Med.	20	19	1	5.0	0	0	0.0
University of Cincinnati, Coll. of Med.	20	19	0	0.0	0	1	100.0
Western Reserve University	36	32	0	0.0	4	0	0.0
OKLAHOMA +25.6	**16**	**12**	**1**	**7.7**	**4**	**2**	**33.3**
University of Oklahoma	16	12	1	7.7	4	2	33.3
OREGON —23.5	**21**	**13**	**4**	**23.5**	**4**	**0**	**0.0**
University of Oregon	21	13	4	23.5	4	0	0.0
PENNSYLVANIA +1.4	**409**	**184**	**13**	**6.6**	**195**	**16**	**8.0**
Hahnemann Medical Coll. and Hosp.	15	5	0	0.0	10	0	0.0
Jefferson Medical College	158	50	5	9.1	99	7	6.8
Medico-Chirurgical Coll. of Philadelphia	68	41	2	4.7	20	5	20.0
Temple University	22	11	4	26.7	7	0	0.0
University of Pennsylvania	74	32	0	0.0	41	1	2.4
University of Pittsburgh	47	41	2	4.7	3	1	25.0
Woman's Med. Coll. of Pennsylvania	24	4	0	0.0	18	2	10.0
SOUTH CAROLINA +19.5	**32**	**25**	**4**	**13.8**	**2**	**1**	**33.3**
Medical College of South Carolina	32	25	4	13.8	2	1	33.3
TENNESSEE +24.1	**344**	**65**	**2**	**3.2**	**205**	**77**	**27.3**
Lincoln Memorial University	16	10	1	9.1	4	1	20.0
Meharry Medical College	128	18	0	0.0	69	41	36.9
University of Tennessee	76	5	1	16.7	58	12	17.1
University of West Tennessee	42	6	0	0.0	19	17	47.2
Vanderbilt University	82	21	0	0.0	55	6	9.8
TEXAS —1.5	**72**	**64**	**1**	**1.5**	**7**	**0**	**0.0**
Baylor University	20	16	0	0.0	4	0	0.0
Fort Worth School of Medicine	12	11	1	8.3	0	0	0.0
Southern Methodist University	6	5	0	0.0	1	0	0.0
University of Texas	34	32	0	0.0	2	0	0.0
VERMONT +20.7	**57**	**28**	**0**	**0.0**	**23**	**6**	**20.7**
University of Vermont	57	28	0	0.0	23	6	20.7
VIRGINIA +14.0	**143**	**78**	**3**	**3.7**	**51**	**11**	**17.7**
Medical College of Virginia	111	64	3	4.5	33	11	25.0
University of Virginia	32	14	0	0.0	18	0	0.0
WISCONSIN +10.3	**54**	**45**	**1**	**2.2**	**7**	**1**	**12.5**
Marquette University	54	45	1	2.2	7	1	12.5
Totals +6.0	4421	2543	289	9.8	1358	251	15.6

In this table the graduates of each college who were examined in the state in which the college is located are grouped in one column, while graduates of that college examined in other states are in another column. For example, under Kentucky, this table shows that, of the 101 graduates of the University of Louisville Medical Department who were examined by state boards during 1915, 58 were examined in Kentucky, of which number 55 passed and 3, of 5.2 per cent., failed, while 43 were examined in other states, of which number 34 passed and 9, or 21.0 per cent., failed.

This table shows that in many instances the graduates have better chances of passing examinations in the state in which their colleges are located than they have elsewhere. This should always be considered in making comparisons between colleges. A low standard college by having all its graduates examined in the home state, or by a partisan board, may show a lower percentage of failures than a college of much higher grade which has graduates examined by several states.

The heavy-faced figures give the results by states. The first column of heavy-faced figures, preceded by the + and — signs, shows the differences between the percentages of examination in the home state and the examinations elsewhere. The plus sign indicates that graduates have better chances of success in the state where the colleges from which they graduated are located; the minus sign indicates that the chances are better elsewhere. The most marked variations in 1915 were in the examination of the graduates of the colleges of Arkansas, 35.5 per cent.; North Carolina, 34.2; Oklahoma, 25.6; Georgia, 24.7; Tennessee, 24.1, and Michigan and Vermont, each 20.7, in all of which the chances of the graduates were better in the home state. The marked variations where the graduates' chances were better elsewhere were in Alabama, 24.9 per cent.; Oregon, 23.5, and New York, 12.0 per cent.

The danger of forming hasty conclusions from these percentages taken alone, however, is very well shown by the figures for Ohio where 20 graduates of the University of Cincinnati College of Medicine were examined, and where the failure of the one examined in "other states" could have been accidental. More reliable are the percentages in Tennessee, Illinois, Pennsylvania, Kentucky and Missouri where larger numbers were examined both at home and in "other states." The totals show that, on the average, the chances of success were 6.0 per cent. better if the graduate took the examination in the state where his college was located.

in Tables I, J and K. By all methods—examination, reciprocity, under exemption, etc.—5,872 physicians were licensed during 1915, or 75 more than in 1914, but 629 less than in 1913, and 1,993 less than in 1906, when 7,865 physicians were licensed.

Other deductions from the larger tables have been made and are presented in Tables E to H, which are worthy of study.

Study of Colleges by State Groups

Table E is based on the first three large tables and gives the results for the group of colleges located in each state. It shows what states are furnishing the largest number of physicians, and the failure percentages indicate what kind of training these colleges are furnishing, so far as may be judged from the failures of their graduates before state boards. By comparing the percentages of the first column with the other columns, it can be seen whether or not there has been any reduction in failures for graduates of recent years. Of the 33 states having medical colleges which grant degrees, 15 furnished 100 or more candidates examined, 6 states furnished more than 200 each, and 4 furnished over 300 each. Illinois furnished 719 graduates, followed by New York with 673 and Pennsylvania with 449. Of the 33 groups of colleges, 18 had failure precentages of less than 10 per cent., 9 had failure percentages between 10 and 20, and 6 had over 20 per cent. of failures. Of all states, the highest failure precentage was obtained by the Alabama group, 38.6, followed by the North Carolina group, 31.1, and the District of Columbia group, 28.8. Other deductions are given with the table.

Study of Larger Colleges

Table F is also based on the three large tables, and gives the results of state board examinations as they affect the 35 largest medical colleges. Although these colleges represent 36.5 per cent. of the medical colleges in the United States having graduates examined, they furnish 70.5 per cent. of all candidates for license coming from medical schools of the United States. This table shows, however, that the graduating of large classes by a medical college does not prove excellence of teaching, since several colleges having 100 or more examined have very high failure precentages, and this holds true even for the graduates of 1915. In fact, the larger the college from the point of view of the number of students and graduates, the more serious is inferior teaching ability, indicated by a high failure percentage. In fairness to medical students, and in the interests of the public, such schools should greatly strengthen their teaching facilities or reduce the size of their classes.

Of the 3,364 candidates who came from these larger schools, 424, or 12.6 per cent., failed, as compared with 12.9 per cent. of failures for the 1,409 candidates from the 60 colleges having less than 50 each examined.

Besides the graduates of the medical colleges of the United States, 540 candidates were examined, made up of 60 graduates of Canadian colleges, 86 foreign college graduates, 329 graduates of miscellaneous colleges and 65 nongraduates. Of these 540 candidates, 221, or 40.9 per cent., failed.

Results in Home States and Elsewhere

Table G is of much interest, because it shows for each college the results of examinations in the state in which the college is located, as compared with the results of examinations in other states, where there is less probability of local influence. Of all recent graduates examined in 1915, coming from the 95 medical colleges of the United States which had candidates examined, 2,812, or 63.6 per cent., took their license examinations in the states in which were located the colleges from which they graduated. Of this number, 9.6 per cent. failed on the average, whereas, of the 1,609 candidates examined in other states, 15.6 per cent. failed. This would indicate that, on the average, the student had 6 per cent. better chances of passing the license examination by taking it in the state in which the college is located. No graduates of the medical college in Vermont failed in the examinations given in that state, although of the graduates of that college who were examined in other states, 20.7 per cent. failed. There were no failures either at home or in other states for graduates of the colleges of Colorado, Connecticut, Indiana, Iowa, Kansas, Minnesota or New Hampshire. The student's chances for success at home and elsewhere were equal, or nearly so, in the groups of colleges of Maryland, Pennsylvania and Texas. The student's chances were unusually better in the home state in Alabama, Arkansas, Georgia, Michigan, North Carolina, Oklahoma and Texas, while in New York and Oregon the student's chances were far better in other than the home state.

TABLE H.—PHYSICIANS EXAMINED BY STATE BOARDS, 1911 TO 1915, INCLUSIVE

STATE	1911		1912		1913		1914		1915		Totals			
	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Examined	Registered	Rejected	Percentage Rejected
Alabama	107	54	84	72	90	57	115	60	79	45	763	475	288	37.7
Alaska	...	...	...	...	...	...	4	0	6	0	10	10	0	0.0
Arizona	28	9	32	10	26	9	26	16	10	7	173	122	51	29.5
Arkansas	108	30	124	27	91	28	97	16	75	7	603	495	108	17.9
California	227	59	256	60	163	36	113	45	137	39	1135	896	239	21.1
Colorado	33	8	41	1	53	5	31	1	19	5	197	177	20	10.2
Connecticut	73	20	70	18	77	51	46	8	46	17	426	312	114	26.7
Delaware	22	0	22	1	12	1	18	0	13	0	89	87	2	2.3
Dist. of Columbia	25	8	49	7	55	5	47	12	51	13	272	227	45	16.5
Florida	87	23	114	31	116	49	106	37	83	25	671	506	165	24.6
Georgia	148	28	178	17	171	24	179	21	176	17	959	852	107	11.2
Idaho	41	13	35	12	21	2	19	2	23	1	169	139	30	17.8
Illinois	432	154	505	134	567	98	484	110	439	64	2987	2427	560	18.8
Indiana	114	7	95	4	101	1	48	2	49	3	424	407	17	4.0
Iowa	75	6	131	7	107	4	77	1	85	4	497	475	22	4.8
Kansas	56	25	50	12	80	7	37	4	29	4	313	261	52	16.6
Kentucky	88	30	88	8	78	12	59	7	83	7	466	396	70	15.0
Louisiana	123	30	128	36	69	20	76	24	69	21	596	465	131	22.0
Maine	86	11	74	17	46	9	54	11	63	6	377	323	54	14.6
Maryland	160	39	100	46	108	40	105	27	111	29	825	644	181	21.9
Massachusetts	226	74	227	54	215	74	226	97	238	65	1496	1132	364	24.3
Michigan	127	1	159	3	99	3	138	2	120	6	658	643	15	2.2
Minnesota	58	7	55	5	71	4	47	3	59	6	315	240	25	7.9
Mississippi	115	113	56	48	61	19	51	17	84	15	579	367	212	36.6
Missouri	182	38	213	32	200	25	195	33	200	22	1140	990	150	13.2
Montana	44	19	50	9	57	16	58	25	48	16	342	257	85	24.9
Nebraska	67	11	88	10	87	2	66	6	70	6	413	378	35	8.5
Nevada	8	1	8	1	10	3	7	3	12	1	54	45	9	16.7
New Hampshire	18	5	36	7	17	3	36	6	6	1	135	113	22	16.3
New Jersey	107	15	59	14	69	7	41	13	71	8	404	347	57	14.4
New Mexico	2	2	6	2	0	1	8	2	5	0	34	27	7	20.6
New York	536	164	433	153	511	205	501	160	618	165	3455	2599	856	24.8
North Carolina	92	30	87	37	77	34	81	37	106	30	611	443	168	27.5
North Dakota	25	1	15	7	16	1	15	1	10	5	108	81	27	25.0
Ohio	170	8	199	12	189	3	146	18	149	3	897	853	44	5.0
Oklahoma	123	39	94	27	58	5	48	12	50	13	469	373	96	20.5
Oregon	94	50	96	65	112	36	76	42	56	30	647	434	213	32.9
Pennsylvania	515	27	356	170	345	59	101	22	208	24	1827	1525	302	16.5
Rhode Island	32	5	39	12	28	4	27	5	26	6	184	152	32	17.4
South Carolina	94	27	90	35	99	47	68	37	53	36	586	404	182	31.0
South Dakota	53	5	16	1	30	1	25	4	25	0	160	149	11	6.9
Tennessee	213	42	313	76	306	94	149	205	101	4	1503	1082	421	28.0
Texas	151	19	151	13	168	11	152	11	136	11	823	758	65	7.9
Utah	22	3	20	2	24	3	13	3	21	1	112	100	12	10.7
Vermont	51	1	45	2	24	2	28	0	36	0	189	184	5	2.6
Virginia	115	43	105	30	87	19	98	10	100	8	615	505	110	17.9
Washington	102	43	69	27	63	22	92	5	75	14	512	401	111	21.7
West Virginia	88	22	66	20	58	17	51	4	70	7	403	333	70	17.4
Wisconsin	107	7	68	19	98	8	81	4	74	10	476	428	48	10.0
Wyoming	8	0	11	0	10	1	4	0	13	0	47	46	1	2.1
Totals	6900		6879		6435		5570		5313		31146			
Registered	5578		5466		5236		4370		4486		25135			
Rejected	1382		1413		1199		1200		827		6011			
Per Cent. Rejected	19.9		20.5		18.6		21.6		15.6		19.3			

This table gives the number of candidates registered and rejected on examination by each state during each of the last five years. The last four columns give the totals for the five years and the percentage rejected by each state.

Five states registered over 1,000 candidates by examination in the five years, these being Illinois, Massachusetts, New York, Pennsylvania and Tennessee. Over 2,000 were registered in only two states, New York with 2,599, and Illinois with 2,427. Altogether 25,135 physicians were registered *by examination* in five years, an average of 5,027 each year.

The eight highest percentages of rejections for the five years were in Alabama, 37.7; Mississippi, 36.6; Oregon, 32.9; South Carolina, 31.0; Arizona, 29.5; Tennessee, 28.0; North Carolina, 27.5, and Connecticut, 26.7 per cent. Massachusetts, Oregon, Tennessee and (until 1912) Mississippi included nongraduates among those examined during the last five years, and for that reason would be expected to have higher percentages rejected. On the other hand, in several states the boards refused to recognize certain colleges and eliminated many candidates prior to the examination by a careful scrutiny of credentials and as a result the percentages of failures at the examinations are lower than otherwise would be the case.

Omitting Alaska, the lowest failure percentages were in Wyoming, 2.1; Michigan, 2.2; Delaware, 2.3; Vermont, 2.6; Indiana, 4.0; Iowa, 4.8, and Ohio, 5.0.

TOTAL RESULTS FOR FIVE YEARS

Table H shows the number registered and the number rejected in each state for each of the past five years. A comparison of this table with the statistics in the last educational number of THE JOURNAL (Aug. 21, 1915, p. 697, Table 14) shows—what would be expected—that the states having the largest number of medical graduates examined the largest number of physicians. New York leads, having examined 3,455 candidates in five years, followed by Illinois with 2,987. The five states having the next highest numbers examined are Pennsylvania with 1,827, Tennessee with 1,503, Massachusetts with 1,496, Missouri with 1,140 and California with 1,135. This table shows only those registered by examination. The next table (I) shows the total registered by all methods.

TABLE I.—REGISTRATION BY STATE BOARDS DURING THE YEAR 1915

STATES	By Examination			By Reciprocity	Without Written Examination or Under Exemption	Total Registered
	Graduates, 1911-1915	Graduates, 1910 and Previous	Nongraduates			
Alabama	73	6	....	....	....	79
Alaska	1	5	....	....	....	6
Arizona	4	6	....	....	3	13
Arkansas	66	9	....	23	....	98
California	127	10	....	175	....	312
Colorado	15	2	2	63	....	82
Connecticut	38	8	....	4	5	55
Delaware	11	2	....	8	....	21
District of Columbia	45	6	....	2	....	53
Florida	42	41	....	....	....	83
Georgia	173	3	....	23	....	199
Idaho	9	14	....	3	....	26
Illinois	414	25	....	46	....	485
Indiana	44	5	....	42	....	91
Iowa	66	19	....	65	....	150
Kansas	28	1	....	54	....	83
Kentucky	82	1	....	16	4	103
Louisiana	69	0	....	8	....	77
Maine	54	7	2	6	....	69
Maryland	108	3	....	30	1	142
Massachusetts	193	32	13	....	....	238
Michigan	117	3	....	66	....	186
Minnesota	53	6	....	45	....	104
Mississippi	82	2	....	3	....	87
Missouri	176	24	....	63	....	263
Montana	28	20	....	....	....	48
Nebraska	68	2	....	41	....	111
Nevada	10	2	....	11	....	23
New Hampshire	4	2	....	20	....	26
New Jersey	65	6	....	86	....	157
New Mexico	2	3	....	2	46	53
New York	582	36	....	31	8	657
North Carolina	101	3	2	32	2	140
North Dakota	8	2	....	17	....	27
Ohio	147	2	....	72	....	221
Oklahoma	39	11	....	64	....	114
Oregon	34	21	1	....	....	56
Pennsylvania	207	1	....	11	....	219
Rhode Island	21	5	....	....	....	26
South Carolina	49	4	....	....	....	53
South Dakota	20	5	....	7	....	32
Tennessee	77	11	13	12	1	114
Texas	122	14	....	31	2	169
Utah	17	4	....	8	....	29
Vermont	31	5	....	1	....	37
Virginia	97	3	....	43	....	143
Washington	44	31	....	....	....	75
West Virginia	70	0	....	28	....	98
Wisconsin	73	1	....	52	....	126
Wyoming	8	5	....	....	....	13
Totals	4014	439	33	1314	72	5872

This table shows the total number registered during 1915 in each state by the various methods. The first three columns show those registered by examination; the first column showing the recent graduates registered, the second column, the old practitioners (graduates of 1910 and previous years) and the third column, the nongraduates. The fourth column shows the number licensed through reciprocity, the fifth column shows those licensed under various exemption clauses in the practice acts, such as because of national fame or by recognition of diplomas (New Mexico).

It is interesting to note that as a rule states which have registered large numbers through reciprocity, Michigan, Colorado and New Jersey for example, have examined very few old practitioners. The large registration through reciprocity in California is due to the fact that registration under a practice act providing for the recognition of licenses granted in other states was begun only recently. There were no reciprocal registrations in ten states, including Alaska.

The last column shows the total number of physicians registered by all methods in each state during the year. Only three states registered over 300 each, these being New York, 657; Illinois, 485, and California, 312. Thirteen states registered less than 50 each. The largest registration was 657 in New York and the smallest was 6 in Alaska. The total was 5,576, an increase of 79 over last year.

TOTAL REGISTRATION IN 1915

The tables thus far described have referred only to the results of examinations and to those registered on that basis. Table I, however, shows the total number who received licenses in each state, including those registered by examination, by reciprocity and under various exemption clauses. Altogether 5,876 physicians were registered by all methods during 1915, as compared with 5,797 in 1914, 6,501 in 1913, 6,723 in 1912, 6,824 in 1911, 7,352 in 1910 and 7,865 in 1906. There has been a constant decrease in the totals licensed by all methods until this year, which shows an increase of 79. By reciprocity or under exemption clauses, 1,386 were licensed in 1915, as compared with 1,427 in 1914, 1,265 in 1913, and 1,257 in 1912. Although there has been a slight decrease since last year, there has been a gradual increase in the numbers licensed through reciprocity since 1906.

Over 100 were registered by all methods in twenty-one states, over 200 in seven and over 300 in three, the largest numbers being registered in New York with 657, Illinois with 485 and California with 312. Of those licensed in California, 175, or 56 per cent., were registered under the new practice act, which provides for the endorsement of licenses granted by the boards of other states.

Table J gives those registered without examination on presentation of satisfactory credentials, which include a license issued by some other state. This is commonly referred to as "reciprocity," which conveys the idea that the state which accepts the license of another must be granted the same courtesy by the state issuing the original license. The term does not well describe this method of registration, however, since some state boards—Colorado and California, for example—accept the physician's credentials, if satisfactory, whether or not the state board issuing the original license returns the favor. Had not reciprocal relations been established by the 39 states shown in Table J, 1,314 physicians, many of whom have been in practice for ten or more years, would have been compelled to undergo the ordeal of a second trying examination.

RECIPROCITY AND EDUCATIONAL STANDARDS

As usually administered, reciprocal relations tend to lower rather than to elevate educational standards, and this is particularly true in some states. A study of these statistics will show that in several instances such relations exist between states differing widely in their standards of education and in the methods and severity of their examinations. It can be seen, therefore, that *a loosely administered provision for reciprocity provides a wide-open door through which unqualified candidates can obtain registration.* There are some boards, however, which wisely reserve and exercise the right to reject any candidate who does not possess satisfactory credentials even though he is licensed in a state with which it has reciprocal relations. Some boards also prudently require that the applicant, before he is eligible to registration through reciprocity, must have been engaged in the actual and reputable practice of his profession for at least a year in the state in which the original license was granted. Without this provision a candidate would be tempted to obtain his original license in the state giving the easiest examination. Without the one-year clause, therefore, standards of examination are apt to be lowered.

Again, some states wisely refuse to register by reciprocity any candidates who have failed to pass their own examination, but this rule is not generally observed. In the establishing of reciprocal relations, therefore, the state board should reserve and exercise the discretionary power *to refuse to register any candidate who could not originally have registered in that state,* and, secondly, the board should require that the applicant shall have been in actual practice of medicine for at least a year before he is eligible to registration under the reciprocity provision.

In the light of the foregoing statement in regard to reciprocity, it will be interesting to study Table K, which shows in what states the original licenses were granted of those who

TABLE J.—PHYSICIANS REGISTERED THROUGH RECIPROCITY BY STATE EXAMINING BOARDS DURING 1915

STATE BOARDS OF	Total Reg. by Recip., Ex. State	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Col.	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Army	Alaska, Hawaii, etc.	Foreign
Number	....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Arkansas	23	..	..	2	..	..	..	..	..	..	1	..	1	1	..	1	3	4	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	2	..	..	1	..	..	..	..
California	175	..	6	2	..	4	1	..	4	1	1	..	38	5	10	3	2	3	..	1	5	8	11	..	9	1	7	6	..	1	1	6	..	1	10	1	1	9	1	..	..	1	..	1	1	2	8	1	1	..	1	..	..
Colorado	63	..	..	2	2	..	2	..	2	1	..	..	13	3	3	2	3	..	..	1	1	2	1	1	8	..	1	..	..	..	..	4	..	..	4	1	..	..	..	2	2	..	..	..	..	..	..	..	1	..	..	1
Connecticut	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Delaware	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	1	..	..	..	..	..	1	..	1	..	..	..	..
Dist. of Columbia	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..
Georgia	23	..	..	2	..	..	..	..	..	..	..	..	..	1	1	2	2	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	1	..	..	..	..	..	4	..	..	..	2	1	..	1	1	..	2	..	..	..
Idaho	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..
Illinois	46	..	..	1	..	..	..	..	..	..	..	..	..	4	..	..	4	..	1	2	..	4	1	..	18	..	1	..	..	..	2	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..	..
Indiana	42	..	..	..	..	..	..	..	..	..	..	..	17	..	..	..	4	..	..	4	..	2	..	..	4	..	1	..	..	..	..	1	..	..	4	..	..	2	..	..	..	3	..	..	..	..	..	..	..	..	..	..
Iowa	65	..	..	..	..	1	..	..	..	..	1	..	..	5	..	1	1	1	3	2	..	15	..	24	1	..	..	..	..	..	..	..	..	..	2	..	..	3	..	..	..	..	..	..	..	..	..	4	1	..	..	..
Kansas	54	..	..	9	..	..	..	..	..	..	..	..	11	3	4	..	..	1	1	..	..	1	..	..	13	..	4	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..
Kentucky	16	..	..	1	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1	..	2	..	..	..	..	1	..	1	..	..	..	..	..	..	..
Louisiana	8	..	..	1	..	..	..	..	..	..	1	..	2	..	..	1	1	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maine	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..
Maryland	30	..	..	1	..	..	..	1	..	..	..	..	3	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	5	..	1	..	2	..	..	..	3	..	6	1	..	..	..
Michigan	66	..	..	..	..	1	..	..	..	..	..	..	21	3	4	..	2	..	1	2	..	..	1	..	..	..	..	..	2	1	..	5	1	..	4	..	..	3	..	1	..	2	1	..	1	1	2	..	4	..	..	..
Minnesota	45	..	..	..	..	..	..	..	..	..	..	..	15	1	6	..	1	..	..	1	..	..	..	..	2	..	2	..	..	..	..	..	..	1	2	..	..	..	..	..	5	..	..	..	..	..	..	2	..	..	4	1	..	..
Mississippi	3	..	..	1	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Missouri	63	..	..	..	1	1	..	..	..	..	..	..	14	3	7	16	4	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	2	..	..	..	..	..	1	1	..	1	..	..	..	..	..
Nebraska	41	..	..	..	..	3	..	..	..	..	..	..	14	2	4	3	1	..	..	1	..	2	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..
Nevada	11	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..
New Hampshire	20	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	2	..	..	7	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..
New Jersey	86	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..	4	1	1	..	1	..	..	..	..	1	..	..	..	38	..	..	2	..	..	24	..	..	..	1	..	5	..	..	3	..	..	..	..
New Mexico	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..
New York	31	..	..	..	..	..	3	..	..	..	..	..	..	3	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	13	..	..	..	4	..	..	..	..	..	..	2	..	3	..	..	1	..	..	..	..	..	..
North Carolina	32	1	..	..	..	1	..	..	..	4	..	..	1	..	..	1	1	1	..	4	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	1	..	2	..	8	..	..	..	5	..	..	..	..	..	..	..	..
North Dakota	17	..	..	..	..	..	..	..	..	..	..	..	6	1	1	1	..	..	..	..	..	..	5	..	1	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ohio	72	..	..	..	..	1	..	..	1	..	..	..	11	4	1	2	1	1	..	3	..	9	..	..	3	..	1	..	..	2	..	10	..	..	..	..	..	11	..	..	..	4	..	..	6	1	..	..	..	..	..
Oklahoma	64	..	..	13	..	..	..	..	..	..	2	..	3	..	..	8	4	..	..	1	..	2	..	1	4	..	3	..	..	..	3	..	..	1	..	..	..	1	..	..	..	8	6	..	1	..	..	3	..	..	..
Pennsylvania	11	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	1	..	..	1	..	..	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	1	1	..	1	..	..	..	..	..
South Dakota	7	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tennessee	12	..	..	..	..	..	..	1	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	3	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..
Texas	31	..	..	3	..	..	..	..	..	3	..	..	1	..	..	2	..	..	2	..	1	1	1	5	..	..	..	..	..	..	..	..	..	1	4	4	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..
Utah	8	..	..	..	..	1	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..
Vermont	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virginia	43	..	..	..	..	..	..	5	2	3	..	..	1	..	..	..	2	2	..	3	1	..	..	1	1	..	..	..	..	..	..	4	..	1	2	..	3	..	..	3	..	..	7	..	..	..	..	4	..	..	..	..
West Virginia	28	..	..	..	..	..	..	1	..	1	..	..	1	1	1	..	4	..	..	3	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	..	3	..	2	..	4	..	..	..	3	..	..	..	..	..	..
Wisconsin	52	..	..	1	..	..	..	..	..	..	1	..	25	..	1	..	1	..	..	..	1	4	3	..	4	..	..	..	..	..	..	1	1	..	2	..	..	3	..	..	..	2	1	..	..	..	..	..	1	..	..	..
Totals	1314	1	6	37	3	15	3	6	18	4	22	1	198	43	46	39	48	16	12	38	19	42	54	10	104	1	50	9	4	22	5	73	13	6	47	28	2	79	2	12	7	34	12	6	25	30	10	36	29	5	1	..	1
Number	....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

This table shows the number of physicians registered by each state through reciprocity during 1915. Reading from left to right, it shows the total number of physicians registered through reciprocity in the state named and the numbers of such candidates coming from the states named in the corresponding columns. Reading from above downward, the figures show the number of physicians who left the state named at the head of the column and went to each of the states named in the corresponding lines, and at the bottom, the total number of candidates leaving the state to go elsewhere. For example, reading from left to right, the table shows that South Dakota registered seven candidates through reciprocity in 1915 and that, of these candidates, 5 came from Minnesota, and 1 each from Colorado and North Dakota. Reading from above downward, the table shows that from South Dakota 5 candidates went to Minnesota, and 2 to North Dakota, the total leaving the state to go elsewhere being 7.

The line at the bottom shows in what states physicians who were registered through reciprocity obtained their original licenses. From Illinois 198 candidates obtained their original licenses, followed by Missouri with 104, Pennsylvania with 79, and New York with 73.

TABLE K.—RECIPROCAL REGISTRATION IN FIVE YEARS (SHOWING WHAT STATES ISSUED THE ORIGINAL LICENSES)

STATE	Physicians Going from States Named During					Totals
	1911	1912	1913	1914	1915	
Alabama	3	1	2	1	1	8
Arizona	.....	.....	3	13	6	22
Arkansas	11	15	37	20	37	120
California	1	.....	.....	2	3	6
Colorado	16	9	12	25	15	77
Connecticut	.....	1	2	1	3	7
Delaware	9	15	8	2	6	40
District of Columbia	23	18	17	22	18	98
Florida	.....	1	1	2	4	8
Georgia	7	13	26	17	22	85
Idaho	.....	5	.....	5	1	11
Illinois	236	193	171	197	198	995
Indiana	37	40	33	44	43	197
Iowa	65	58	36	52	46	255
Kansas	50	27	32	42	39	190
Kentucky	42	36	43	35	48	204
Louisiana	8	10	13	10	16	57
Maine	14	23	9	11	12	69
Maryland	52	48	42	44	38	224
Massachusetts	2	2	2	7	19	32
Michigan	69	59	66	58	42	294
Minnesota	29	29	29	23	34	144
Mississippi	3	5	15	10	10	43
Missouri	59	67	61	98	104	389
Montana	.....	1	.....	3	1	5
Nebraska	46	29	34	37	50	196
Nevada	2	3	4	8	9	26
New Hampshire	6	1	7	3	4	21
New Jersey	14	18	10	19	22	83
New Mexico	1	4	8	9	5	27
New York	42	46	70	101	73	332
North Carolina	16	12	14	7	13	62
North Dakota	7	12	6	5	6	36
Ohio	40	39	50	71	47	247
Oklahoma	3	28	74	22	28	155
Oregon	.....	.....	3	3	2	8
Pennsylvania	12	57	86	86	79	320
Rhode Island	.....	.....	.....	1	2	3
South Carolina	4	5	3	2	12	26
South Dakota	2	1	10	4	7	24
Tennessee	28	51	39	42	34	194
Texas	10	24	19	23	12	88
Utah	2	3	12	8	6	31
Vermont	26	30	11	21	25	123
Virginia	28	25	36	40	30	149
Washington	7	3	2	15	10	37
West Virginia	45	29	41	33	36	184
Wisconsin	41	35	28	41	29	174
Wyoming	2	4	4	3	5	18
Alaska, Hawaii, etc.	.....	1	1	2	.....	4
U. S. Army	.....	2	1	2	1	6
U. S. P. H. Service	.....	.....	.....	.....	.....	.....
Canada	.....	.....	.....	1	.....	1
Foreign and Misc.	.....	3	.....	2	1	6
Totals	1128	1141	1223	1355	1314	6161

This table shows that 6,161 candidates were registered through reciprocity during the last five years. Registration by reciprocity has been gradually increased since 1911. A study of the totals for the different states shows that of the 6,161 registered during the four years 995, or 16.1 per cent., obtained their original licenses in Illinois. This is more than twice the number coming from any other state. The states furnishing the next highest numbers are Missouri, 389; New York, 332, and Pennsylvania, 320.

Ten states (Alabama, Arizona, Florida, Massachusetts, Montana, Oregon, Rhode Island, South Carolina, Washington and Wyoming) do not have reciprocal relations and would not appear in this table except for the fact that some states, like California, Colorado and New Jersey, will accept a physician's credentials if satisfactory, whether the state issuing his original license returns the favor or not.

were registered elsewhere under the reciprocity provision during the last five years. It should be noted that of the 6,161 physicians licensed through reciprocity during the last five years, the largest number coming from any one state was 995 who obtained their original licenses in Illinois. Although Illinois and New York have about an equal number of medical college graduates each year,[1] only 332 physicians obtained original licenses in New York and registered elsewhere through reciprocity in the last five years. This is doubtless because Illinois has reciprocal relations with twenty other states while New York has established such relations with only five.

1. See Table 14, JOURNAL A. M. A., Aug. 21, 1915, p. 697.

TABLE L.—STATE REQUIREMENTS OF HIGHER PRELIMINARY EDUCATION

There are now thirty-one states which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirement becomes effective are as follows:

State Examining Board of	Number of Years Required	Affects Students Matriculating	Affects All Graduates
Requiring two years—			
Alabama	2	1915-16	1919
Colorado	2	1910-11	1914
Indiana	2	1911-12	1915
Iowa	2	1911-12	1915
Minnesota	2	1908-09	1912
New Hampshire	2	1915-16	1919
New Jersey	2	1917-18	1921
North Dakota	2	1908-09	1912
Oklahoma	2	1917-18	1921
South Dakota	2	1911-12	1915
Virginia	2	1917-18	1921
Wisconsin	2	1915-16	1919
Requiring one year—			
Arkansas	1	1915-16	1919
California	1	1915-16	1919
Connecticut	1	1910-11	1914
Illinois	1	1915-16	1919
Indiana*	1	1910-11	1914
Kansas	1	1910-11	1914
Kentucky	1	1914-15	1918
Louisiana	1	1915-16	1919
Maryland	1	1914-15	1918
Michigan	1	1914-15	1918
Mississippi	1	1915-16	1919
New Hampshire*	1	1914-15	1918
New Jersey*	1	1916-17	1920
North Carolina	1	1914-15	1918
Oklahoma*	1	1914-15	1918
Pennsylvania	1	1914-15	1918
Rhode Island	1	1914-15	1918
Tennessee	1	1915-16	1919
Texas	1	1914-15	1918
Utah	1	1913-14	1917
Vermont	1	1913-14	1917
Virginia*	1	1914-15	1918
Washington	1	1914-15	1918
West Virginia	1	1917-18	1921

* The 2-year requirement also adopted; effective later.

TABLE M.—ADVANCES IN STATE LICENSE REQUIREMENTS IN TEN YEARS

Requirement or provision	States having provision for			States still having no provision for
	1904	1916	Increase	
Preliminary Education—				
Any requirement	20	45	25	4
A standard four-year high school education or higher	10	30	20	10
One or two years of college work as a minimum	0	31	31	18
That all applicants be graduates of a medical college	36	48	12	1
That all applicants undergo an examination for license	45	48	3	1
Requirement of practical tests in the license examinations	1	7	6	42
Full authority by board to refuse recognition to low-grade colleges	14	34	20	15
Boards refusing to recognize low-grade colleges*	5	34	29	15
Reciprocal relations with other states	27	40	13	9
Single boards of medical examiners	36	42	6	7

* In three states, Arkansas, Connecticut and Florida, each of which has three separate boards, only the regular (nonsectarian) boards have refused recognition to low standard medical colleges.

IMPROVED STANDARDS OF LICENSURE

Table L shows the states which have adopted one or two years of college work as a minimum standard of preliminary education for those who seek the license to practice medicine in those states. The first column shows the number of years of premedical college work required by each state; the second column shows the session in which students matriculating in medical colleges are affected by the increased requirement, and the third column gives the year in and after which all graduates are affected by the increased requirement. This table shows the remarkable progress which has been made in state board requirements since 1908, prior to which no state was requiring more than a four-year high school education as the minimum standard of preliminary education. As will be noted, there are now thirty-one states which have adopted the higher standard, twelve of which require as a minimum *two years* of premedical college work. It is understood that in every instance the one or two years of collegiate

TABLE N.—ESSENTIAL FEATURES OF STATE LAWS AND CONDITIONS SURROUNDING MEDICAL LICENSURE

State	Graduation Required	Preliminary Education: For Law Provides	Preliminary Education: Years in High School Required	Preliminary Education: Years in a College of Arts‡	Medical Education: Required Years of Medical Study	Medical Education: Minimum Weeks per year	Medical Education: Required Months per year	Medical Education: Minimum Total Hours of Course	Medical Education: Intern Year Required	Has Reciprocity with Other States	Single Board of Examiners	Examination Fee (Dollars)	Reciprocal Fee (Dollars)
Alabama	....	Yes	4	2	4	....	....	....	....	No	....	10	....
Alaska	....	Yes	4	....	4	32	8	3600	....	No	....	25	25
Arizona	....	Yes	4	....	4	....	....	....	....	No	....	25	....
Arkansas	....	Yes	4	1	4	....	....	....	....	....	No	15	25
California	....	Yes	4	1	4	32	8	4000	....	....	....	25	50
Canal Zone	....	....	....	....	....	....	....	....	....	No	....	5	....
Colorado	No	Yes	4	2	4	....	9	3600	....	....	....	25	25
Connecticut	....	Yes	4	1	4	26	6½	3744	....	....	No	15	15
Delaware	....	Yes	4	....	4	....	7	....	....	....	No	10	50
Dist. of Col.	....	No	....	....	....	....	....	....	....	....	No	10	10
Florida	....	....	....	....	....	....	....	....	....	No	No	15	....
Georgia	....	Yes	4	....	4	32	8	5120	....	....	....	20	50
Hawaii	....	....	....	....	....	....	....	....	....	....	....	10	....
Idaho	....	Yes	....	....	....	....	....	....	....	....	....	25	25†
Illinois	....	Yes	4	1	4	32	8	3200	....	....	....	10	10†
Indiana	....	Yes	4	2	4	30	7½	3600	....	....	....	25	50
Iowa	....	Yes	4	2	4	26	7	4180	....	....	....	10	50
Kansas	....	Yes	4	1	4	....	6	....	....	....	....	15	15†
Kentucky	....	Yes	4	1	4	32	8	....	....	....	....	10	10
Louisiana	....	Yes	4	1	4	....	....	....	....	....	No	25	50
Maine	....	Yes	4	....	4	....	....	....	....	....	....	15	15
Maryland	....	Yes	4	1	4	....	....	....	....	....	No	20	25
Massachusetts	....	No	....	....	....	....	....	....	....	No	....	20	....
Michigan	....	Yes	4	1	4	24½	8½	3600	....	....	....	25	50
Minnesota	....	Yes	4	2	4	26	6½	....	....	....	....	10	50
Mississippi	....	Yes	4	1	4	....	....	....	....	....	....	10	50
Missouri	....	Yes	....	....	4	....	7	....	....	....	....	15	25
Montana	....	....	....	....	4	....	6	....	....	No	....	25	....
Nebraska	....	Yes	4	....	4	....	6	....	....	....	....	25	25
Nevada	....	Yes	4	....	4	....	....	....	....	....	....	25	25
New Hampshire	....	Yes	4	2	4	....	9	....	....	....	....	20	20
New Jersey	....	Yes	4	2	4	....	7	....	Yes	....	....	25	50
New Mexico	....	* Yes	4	....	4	30	7½	3600	....	No	....	25	25
New York	....	Yes	4	....	4	....	7	....	....	....	....	25	25
North Carolina	....	Yes	4	1	4	....	....	....	....	....	....	15	50
North Dakota	....	Yes	4	2	4	30	8	3600	....	....	....	25	25
Ohio	....	Yes	4	....	4	30	....	....	....	....	....	25	50
Oklahoma	....	Yes	4	2	4	....	....	....	....	....	....	15	25
Oregon	....	Yes	4	....	4	....	....	....	....	No	....	10	....
Pennsylvania	....	Yes	4	1	4	32	....	....	Yes	....	....	25	50
Philippine Is.	....	Yes	4	....	....	....	....	....	....	No	....	25	....
Porto Rico	....	Yes	4	....	4	....	....	....	....	No	....	20	....
Rhode Island	....	Yes	4	1	4	....	....	....	Yes	No	....	20	....
South Carolina	....	Yes	....	....	4	26	6½	....	....	....	....	10	10
South Dakota	....	Yes	4	2	4	26	6½	....	....	....	....	20	20
Tennessee	....	Yes	4	1	4	....	....	....	....	....	....	10	10
Texas	....	Yes	4	1	4	....	....	3600	....	....	....	25	50
Utah	....	Yes	4	1	4	....	....	....	....	....	....	25	75
Vermont	....	Yes	4	1	4	....	....	3600	....	....	....	20	50
Virginia	....	Yes	4	2	4	....	....	....	....	....	....	25	25
Washington	....	Yes	4	1	4	32	....	....	....	No	....	25	....
West Virginia	....	Yes	4	1	4	....	....	....	....	....	....	10	10
Wisconsin	....	Yes	4	2	4	....	7	....	....	....	....	20	50
Wyoming	....	....	....	....	....	....	....	....	....	....	....	25	25

* Will accept a diploma without examination if from a recognized college.

† Reciprocal fee is the same as that charged by the state from which applicant comes.

‡ Or its equivalent in the medical college.

work must have included courses in physics, chemistry and biology.

In Table M the advance in standards of licensure is shown for all states since 1904. The most marked increase is in regard to the requirement of collegiate work, already referred to. The next greatest increase (29) is in the number of states—thirty-four—which are now refusing to recognize low-standard colleges.

Table N shows the essential features of the various state license laws. It will be noted that only one state—Colorado—now admits nongraduates to the license examination, although it is noteworthy that only four nongraduates have been licensed in that state in ten years. There are seven states in which there are two or three separate boards having in charge the licensing of physicians and surgeons. In five of these states, namely, Arkansas, Connecticut, Florida, Louisiana and Maryland, the boards are entirely independent of each other; in two states, Delaware and the District of Columbia, there is a central board or authority under which the separate boards act.

IN CONCLUSION

In the gathering and publication of these statistics the endeavor has been to give a fair presentation of facts, a knowledge of which is always beneficial. Without question, this annual presentation of the results of state license examinations has had a most helpful influence on medical education and medical licensure in this country. We reiterate our acknowledgments to the state licensing boards for their ready cooperation and the complete reports which have been furnished. For the verification of all figures the reports and data furnished by medical colleges have been most serviceable. We have no doubt that the information here published will be of service not only to the medical colleges and to the state boards, but also to the public, since the end-result is better qualified physicians.

FINANCES OF MEDICAL SCHOOLS[1]

During the last few months an attempt was made to secure from all colleges official statements in regard to the income and expenditures for the college session of 1914-1915. Of the ninety-six colleges which still exist, reports which could be used were received from eighty-two. The items for which information was obtained from these institutions were in regard to income from (*a*) students' fees; (*b*) endowments, including state or city appropriations; (*c*) other sources, and (*d*) total income. In regard to expenditures, information obtained showed the total amounts expended for (*a*) salaries of instructors; (*b*) other expenses, and (*c*) total expenditures.

The eighty-two medical colleges reported total incomes ranging from $411,570, the highest, to $4,529, the lowest. The average for each college was $68,277 and the grand total was $5,598,743.

In students' fees the income for each college ranged from $113,523, the highest, to $500, the lowest. The average income from this source was $23,795 and the grand total was $1,951,219. It will be noted, therefore, that the fees paid by medical students covers a little more than one third of the total income of the medical schools.

The total income aside from students' fees was $3,647,524, ranging from $329,221, the highest, down to the three which had no income aside from fees. The average income aside from students' fees was $44,482.

Included in the income obtained aside from students' fees, thirty-four colleges reported the receipt of a total income from endowments of $1,164,602, or an average of $34,253 for each of the institutions which reported income from this source; twenty-eight colleges reported an income from states or municipalities amounting to $864,285, or an average of $30,868 for each institution.

In regard to expenditures, seventy-eight colleges paid out $2,985,458 in salaries, an average of $38,275 for each of the schools reporting. The highest sum thus expended was $139,430 and the lowest was $3,600. The total expenditure reported by the eighty-two colleges was $5,432,768, or an average of $66,253 for each institution. For three colleges all expenditures were paid from students' fees and for one of them the expenditures were less than the income.

MEDICAL COLLEGE FINANCES FOR 1914-1915

	Income				Expenditures		
	Total	Students' Fees	Endowments†	Other Sources	Total	Salaries	Other Expenses
1	411,570	82,349	208,829	120,392	369,000	133,549	236,051
2	255,327	83,456	.....	171,871	255,327	193,064	62,263
3	241,333	77,059	116,018	48,256	241,333	139,430	101,903
4	234,303	18,242	207,635	8,426	234,303	125,377	108,926
5	195,869	20,850	6,305	168,714	195,869	60,304	135,565
6	160,996	43,176	26,458	91,362	160,996	103,444	57,552
7	146,681	58,675	55,340	32,666	146,675	58,675	88,000
8	140,084	12,000	106,340	21,738	137,243	48,221	89,022
9	133,046	25,206	94,200	13,580	127,347	65,810	61,537
10	132,414	76,750	.....	55,664	132,414	84,352	48,062
11	130,146	33,990	6,888	89,268	130,146	97,083	33,063
12	129,440	30,235	.....	99,205	129,440	118,695	10,745
13	128,262	13,822	38,000	76,440	128,262	70,742	57,520
14	127,325	14,500	110,000	2,825	127,325	65,000	62,325
15	125,000	45,000	80,000	.....	125,000	62,452	62,548
16	119,746	113,523	2,500	3,723	110,661	69,100	41,561
17	116,798	58,901	31,626	26,271	116,798	68,310	48,488
18	114,809	76,767	12,265	25,777	114,800	66,136	48,673
19	98,049	36,574	29,803	31,672	98,049	54,941	43,108
20	95,736	6,006	71,653	18,077	95,736	40,533	55,203
21	95,380	9,031	74,961	11,388	95,380	49,180	46,200
22	94,307	46,485	39,992	7,920	93,234	37,956	55,278
23	83,593	47,836	.....	35,757	69,187	26,173	43,014
24	80,429	6,849	73,580	.....	75,834	63,240	12,594
25	79,662	7,635	70,000	2,027	79,662	63,732	15,930
26*	73,840	9,500	45,040	19,300	73,840	51,920	21,920
27	72,000	72,000	.....	.....	72,000	25,000	47,000
28	69,142	16,325	43,062	9,755	69,142	57,133	12,009
29	65,000	14,000	.....	51,000	65,000	35,000	30,000
30	63,208	44,149	.....	19,059	63,208	22,675	40,533
31	58,000	33,000	25,000	.....	58,000	32,000	26,000
32	57,385	25,085	3,780	28,520	43,852	24,018	19,834
33	56,785	54,295	.....	2,490	47,571	26,718	20,853
34	54,370	54,370	.....	.....	44,266	18,000	26,266
35	53,162	26,320	.....	26,842	53,162	.....	.....
36	52,875	3,375	49,500	.....	52,540	30,044	22,496
37	52,082	34,610	.....	17,472	52,082	25,810	26,272
38	52,113	32,670	15,750	3,693	62,113	29,141	22,972
39	50,000	4,320	28,000	17,670	50,000	26,000	24,000
40	48,000	10,000	38,000	.....	44,685	24,685	20,000
41	44,868	8,021	21,200	15,647	44,868	15,778	29,090
42	43,390	9,970	32,500	920	42,384	23,966	18,418
43	41,400	11,600	15,000	14,800	41,400	14,900	26,500
44	40,600	9,698	26,788	4,114	39,132	30,783	8,349
45	40,574	35,335	4,974	265	40,574	23,808	16,766
46	40,131	15,178	14,000	10,953	40,000	22,995	17,005
47	38,893	16,280	.....	22,613	38,893	28,967	9,926
48	38,456	26,030	.....	12,426	27,671	18,249	9,422
49	36,715	13,215	23,500	.....	32,820	24,589	8,231
50	36,550	10,300	26,250	.....	32,564	15,683	16,881
51	36,440	19,050	.....	17,390	36,440	23,160	13,280
52	36,426	31,750	1,944	2,732	38,311	16,708	19,603
53	35,215	11,840	16,222	7,153	35,215	25,287	9,928
54	33,885	33,885	.....	.....	18,146	15,605	2,541
55	33,010	22,575	.....	10,635	30,076	23,000	7,076
56	32,691	21,382	7,479	3,830	32,691	13,100	19,591
57	27,081	7,992	19,000	89	26,410	17,360	9,050
58	26,791	22,912	662	3,217	26,791	17,036	9,755
59	25,141	11,154	4,971	9,016	18,175	.....	.....
60	23,675	17,501	1,655	4,519	23,675	8,675	15,000
61	23,415	17,145	.....	6,270	22,836	8,930	13,906
62	23,228	10,835	.....	12,393	23,228	7,200	16,028
63	21,849	2,169	19,680	.....	21,849	18,080	3,169
64*	20,683	3,683	16,000	1,000	20,683	13,300	7,383
65	20,000	9,000	.....	11,000	20,000	12,000	8,000
66	19,904	10,234	2,583	7,087	19,904	14,404	5,500
67	19,136	4,764	6,000	8,372	19,136	17,447	1,689
68	18,978	8,329	8,104	2,485	18,978	13,888	5,090
69*	18,000	720	17,280	.....	18,000	16,200	1 800
70*	18,000	575	.....	17,425	18,000	17,200	800
71*	17,000	1,900	15,000	100	16,200	10,200	6 000
72	16,500	13,000	3,500	.....	16,500	6,800	9 700
73*	15,307	3,688	.....	11,619	15,307	10,260	5.047
74	15,200	10,200	.....	5,000	15,170	5,170	10,000
75	14,500	6,460	8,000	40	14,500	11,500	3,000
76	12,400	4,859	.....	7,541	12,400	11,227	1,173
77*	10,090	850	.....	9,150	10,000	.....	.....
78	9,515	3,195	.....	6,320	9,515	4,500	5 015
79	8,280	2,280	.....	6,000	8,200	4,200	4 000
80	6,080	565	5,515	.....	5,425	5,300	125
81*	5,950	1,854	.....	4,096	5,550	.....	.....
82*	4,529	500	429	3,600	4,500	3,600	900
	5,598,743	1,951,219	2,028,887	1,618,637	5,432,768	2,985,458	2,360 023

* Give only two years of the medical course.
† Including aid from state or city.

The total enrolment in these eighty-two medical colleges during the session of 1914-1915 was 12,976. As may be computed, therefore, the average income received from each student in tuition fees was $150, whereas the average expenditure for each student was $419. On the average, therefore, the cost of teaching each student last year was nearly three times greater than the amount he paid in fees in that year.

1. Portion of the 1916 report of the Secretary of the Council on Medical Education, at the Annual Conference, Chicago, Feb. 7, 1916.

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SATURDAY, APRIL 8, 1916

STATISTICS OF STATE BOARD EXAMINATIONS

We publish this week, for the thirteenth consecutive year, tabulated statistics based on official reports of examinations conducted by state medical licensing boards. Other information having a direct bearing on state boards and methods of registration has been included to enable the reader better to interpret the results. For example, Table D shows in what states certain colleges are not recognized, and has an important bearing on the statistics published. Reports have been received from all state boards, making the statistics complete. In 1903, when the publication of these data began, reports could not be secured from the majority of boards because careful and adequate records of the examinations had not been kept.

IMPORTANCE OF THESE STATISTICS

The casual reader will hardly appreciate the conditions which make the publication of these data important. Medical education and medical licensure in this country are controlled by the fifty individual states (including Alaska and the District of Columbia), each of which, in these matters, is organically independent of the others. In the fifty states are as many different practice acts, providing for sixty-two different examining and licensing boards, no two of which entirely agree in the details of the methods followed, or the standards enforced. No legislative provision exists for a national control, for cooperation between the boards, or for uniformity of standards. In some states the public is well protected against illiterate and incompetent physicians, while in other states, because of poor laws or political boards, the right to practice medicine is easily secured, no matter how incompetent the applicant may be. If a doctor has had his license revoked in one state for any cause, he may go to another state, often merely crossing a state line, and he seldom fails to secure a license in some state. If he is caught again, he may as promptly transfer his allegiance to a third state. To correct these serious conditions, an exchange of accurate information and cooperation among state boards is essential. The collection of statistics such as are published this week is a step toward this end. If this country had a national control of the licensing of physicians, such as commonly exists in other countries, it would not be necessary for the American Medical Association to do this work.

FACTS REGARDING EACH STATE

The tables give valuable information in regard to medical licensure in each state. Tables A and B show the number of candidates who appeared for examination, the colleges from which they graduated, the results of their examination, the total number registered, and the total number and percentage of those rejected. This table permits comparison of the totals and the percentages of one state with those of other states. If a state board's examinations are unusually lenient for graduates of medical schools located in that state as compared with the results for the same colleges in other states — which appears to be true in some instances — the fact is shown in Table G. If a state harbors a low-grade medical college, the figures show that the people of that state are the greatest sufferers from the maintenance of the college. To decide whether or not a low percentage of rejections means "leniency," the reader should note in Table D whether the board has *refused to examine* graduates of low-grade colleges. If so, a low failure percentage is to be expected. If, on the other hand, a board admits graduates of any and all schools, or perhaps also nongraduates, high failure percentage would be expected. If, in the latter instance, there is a low failure percentage, then "leniency" is perhaps too mild a term.

The total number of candidates examined by each board in the last five years and the percentage of rejections are shown in Table H. This permits comparison of the figures of the last year with those of the four previous years, and also the figures of one state with those of the others. Table I shows the totals registered by all methods, by examination, by reciprocity and under exemption clauses. This table also shows the number of nongraduates licensed. Table J gives the number of candidates licensed through reciprocity, and shows what states granted the original licenses. Table K gives the total number of physicians who left each state during the last five years and registered in other states through reciprocity. Table L gives the thirty-one states which have adopted higher standards of preliminary education and the dates when the higher requirements are effective. Table M shows the progress in state board requirements during the last ten years, and Table N gives a summary of the essential features of medical practice laws. On the whole, these statistics call attention to the kind of protection the people of each state have against incompetent or ill-trained physicians.

FACTS REGARDING EACH COLLEGE

The tables also give valuable information regarding medical colleges. Tables A and B indicate in what states graduates of each college were examined and the results of the examinations. Additional information for comparative study is given in Tables C and D. Table E shows the results of the examinations for the group of colleges located in each state. Table F furnishes an interesting study of the colleges having fifty or more graduates examined during the year, and allows of comparison between colleges of nearly equal size.

Before a conclusion is formed regarding any college, it is important to note in Table D whether or not its graduates are refused examination in any states. A low-grade college, by having all its graduates appear before a lenient or a partisan board, may occasionally have a very low percentage of failures. The examination results taken alone in such an instance would seem to indicate good teaching methods. This misconception is prevented, however, if it is found, as shown in Table D, that its graduates are not admitted to examination in from ten to thirty-three states. A fairly good college may occasionally have a high percentage of failures, especially if they are in states having more rigid examinations. It is seldom, however, that a well-equipped and well-conducted medical college will, year after year, receive as high as 15 or 20 per cent. of failures. In a word, these statistics throw an important side-light on the facts regarding medical colleges published in August each year in the Educational Number of THE JOURNAL.

TOTAL REGISTRATION IN ALL STATES

These statistics show the number of candidates coming not only from each medical school in this country, but also from Canadian and other foreign medical colleges. They give an accurate record of the number and source of the men who are entering the practice of medicine each year in this country. They show that 5,872 physicians were licensed in this country during 1915; 75 more than in 1914.

STATISTICS ACCURATE AND RELIABLE

The collecting and publishing of these statistics was begun by THE JOURNAL in 1903; but since 1905 that work has been continued as one of the duties of the Council on Medical Education. Every report received from state licensing boards is carefully checked, duplications are avoided, errors are corrected, and the statistics are rendered accurate and reliable. Through the possession of complete alumni lists of all existing medical colleges, the Council is in position to avoid charging a college with a failure which may have been erroneously accredited to it. The possession of this information regarding medical graduates has also permitted the discovery of numerous instances in which fraudulent credentials were presented to state boards. In each instance the board's attention has been promptly called to the facts.

INFLUENCE OF THESE STATISTICS

These statistics have had a much greater effect, however, than that rendered by a mere numerical report of physicians examined. In many states splendid systems of record-keeping are now to be found where formerly no records whatever were kept, or where the systems were far from perfect. They have also furnished abundant argument for practical tests in state license examinations and have undoubtedly had much to do with the improved character of these examinations.

The publication of these statistics has had a marked influence on medical colleges. Whereas previously medical faculties were unaware of the weakness in their methods of teaching, these statistics now show how frequently graduates fail at the state license examinations. The colleges have made marked improvement in their equipment, and better teachers have been secured and better methods adopted.

COOPERATION MUTUALLY ADVANTAGEOUS

These statistics have their greatest value when studied in connection with other data collected by the Council on Medical Education and published in THE JOURNAL and in the Council's reports. The state board statistics are made more accurate and reliable through data furnished by medical colleges; they are based on reports received direct from state boards; through a careful checking of those reports, errors are frequently corrected, the state boards are notified and in this way state records are also made more accurate. The statistics published this week, therefore, have been made possible only through the cordial cooperation of both the state boards and the medical colleges, and for this cooperation we again express our acknowledgments.

THE SPECIFICITY AND UTILITY OF THE ABDERHALDEN REACTION

Any one who has followed the voluminous literature which has appeared with reference to Abderhalden's now well-known ideas of protective enzymes and their application in serologic diagnosis must have been impressed with the numerous seemingly irreconcilable statements on the subject. The value of the reaction as a specific indication of pregnancy has been firmly upheld by one set of observers, only to be denied in equally vigorous terms and with equally convincing evidence by another group of investigators. In the case of the applications of the Abderhalden reaction to the diagnosis of pathologic conditions, as in carcinoma, for example, the situation is even more unsettled. Nothing less than the outbreak of the

European conflict seemed to succeed in putting a quietus on the lively polemic in reference to the reliability of the Abderhalden reaction which filled the columns of some of our German contemporaries a few months ago.

It would be of little interest to our readers to discuss the possible causes for the radical differences of opinion that have been ventured on this subject. It should be pointed out, however, that the Abderhalden reaction, as it has been currently employed, is attended by numerous pitfalls in the direction of errors of technic; and furthermore, it is attended by the inevitably objectionable feature of being open to subjective influence in the observation of the end-results. Those interested will therefore welcome the newest critique of the Abderhalden reaction by D. D. Van Slyke and his associates[1] at the Rockefeller Institute of Medical Research. The reaction involves proteolytic digestion. The New York investigators have substituted for the uncertain qualitative method, first proposed for detecting the proteolysis, Van Slyke's excellent method of amino nitrogen determination. This method, while it cannot be said to furnish an absolute measure of proteolysis, since it involves a determination only of end-products of proteolysis, does furnish a fair index of the relative intensities and progress of proteolytic actions. It has not only the indispensable attribute of being quantitative, but also permits accurate results with the small amounts of material that are available in the serum tests. Furthermore, it is specific for proteolysis, and permits one to follow the chemical change which is characteristic thereof.

The findings from experiments in which every recognized precaution as to manipulation, substrate, etc., was employed, speak for themselves. Practically every serum, whether from a pregnant or a nonpregnant individual, showed protein digestion when incubated with placenta tissue prepared according to Abderhalden. The range of individual variation in proteolytic activity was wide. The range covered by most of the normal serums, however, was identical with that covered by the majority of the pregnant serums. There is a tendency for results from the latter to average somewhat higher than those from nonpregnant. The difference, even in the averages, is not great, however; and the individual variations of both pregnant and nonpregnant serums make the results from the two overlap so completely as to render the reaction, even with quantitative technic, absolutely indecisive for either positive or negative diagnosis of pregnancy. Further evidence of nonspecificity is seen in the fact that carcinoma tissue was digested apparently to about the same extent as was placenta.

After this carefully planned arraignment it will require more than a little argument or revision of technic to restore confidence in the alleged specificity of the Abderhalden test. This is, of course, not the first time that evidence in the same direction has been brought forward.[2] Nevertheless this investigation by Van Slyke bears every evidence of a thorough, objective study of the subject and cannot be overlooked by future workers. At the present time it appears that "nearly all human serums can digest certain coagulated tissue proteins to some extent, but that the source and significance of the proteolytic agents, and the influences that cause their fluctuation, remain as yet undetermined."

1. Van Slyke, D. D.; Vinograd-Villchur, M., and Losee, J. R.: The Abderhalden Reaction, Jour. Biol. Chem., 1915, xxiii, 377.

HOSPITAL LABORATORIES

However great may have been the heritage of medicine from the past, the wonderful development which it has achieved in recent times is directly traceable to the scientific spirit of the present generation. A recent writer[3] on the development of this newer era has pointed out that the stimulus came partly from many extraneous and now familiar sources. The discovery of oxygen, the establishment of the theory of the conservation of energy, the overthrow of the mystic doctrine of vital force, the discovery of protoplasm, the promulgation of the cell theory of organic structure, and the formulation of the theory of evolution all contributed their share. The chief agents through which the great change has come are the laboratory, now little more than threescore and ten years old, and the method of orderly experimentation which the laboratory alone can foster.

We may well pause to ask whether or not the American hospital has done its proper share in recent years to encourage the support of this institution so potent for progress. Few if any of those who understand the true function of the hospital laboratory will contend that it has attained the position and received the help which it deserves in the organization of medical institutions. Few of the independent hospitals, in addition to those which serve largely as teaching institutions, can claim anything more than an equipment for certain routine performances which may be indispensable for accurate diagnosis. This is not due entirely or even largely to the indifference of members of our profession, but rather to the attitude of those who are responsible for the financial support and maintenance of the hospitals, namely, the boards of trustees, consisting of laymen who usually believe that their institutions discharge their duty to the community solely by the cure or relief of suffering humanity.

Doubtless this current attitude, which serves as the guiding factor in the distribution of the hospital budget, is perpetuated unchanged by the widespread,

2. Compare, for example, The Antiferments of the Blood, editorial, The Journal A. M. A., Oct. 30, 1915, p. 1554.

3. Lee, F. S.: Scientific Features of Modern Medicine, New York, 1911, p. 3.

though decreasing indifference of the members of the medical profession in what ought to receive their special concern. Their help is needed to educate those more directly responsible for the management of the hospital as a public organization to an understanding that the hospital laboratory is no longer merely a room where a few interns or a poorly paid worker is expected to make a few elementary routine chemical tests of urine or microscopic examinations of tumors. Richard M. Pearce[4] has thus summarized the functions of the hospital laboratory: 1. To aid in the diagnosis, and therefore the intelligent treatment of disease. 2. To investigate new methods of diagnosis and treatment, and put them into use with the least possible delay. 3. To advance, by investigation, our knowledge of the cause, course, diagnosis and treatment of disease.

If these tenable contentions were securely established in the minds of a wider audience than that of the physicians who serve the hospital, the laboratory would often loom up as a fundamental part rather than as a mere adjunct of the institution. Somehow, and not unnaturally, it is easy to convince a board of trustees of the importance of a well equipped and suitably conducted Roentgen-ray department, because it is easy for a layman to visualize some of its possibilities. He needs to be helped to respect the less conspicuous but equally potent possibilities which reside in the newer diagnostic tests, such as those for renal or other organic function, the abnormal composition of the blood, the serologic phenomena incident to certain diseases, and the compatibility of drugs and serums with the conditions prevalent in the individual. Voluntary or underpaid and overworked staffs cannot facilitate the discovery or even the use of the best of such contributions. Pearce has well remarked that because of the lack of such help from school laboratories, the independent hospital should have a laboratory more thoroughly equipped and more all-embracing in its activities than the school hospital. He reminds us that this is rarely the case, and that despite its isolation, which should be a stimulus to greater effort in behalf of patients, the independent hospital has laboratories, with few exceptions, far inferior as regards equipment, staff and ideals to those of hospitals connected with educational institutions. Hospitals catering to private patients certainly cannot afford an indifferent equipment.

There are signs of a changing order. The dietitian is beginning to assert her true function in the American hospital. The management is beginning to be concerned with the scientific reputation of its institution as well as with the cost-per-day features of the budget. The public is becoming interested in the "discoveries" of hospitals in its community as well as in the opportunities it extends for beneficent relief. To paraphrase Pearce, the trustees of independent hospitals can no longer consistently and blindly neglect the laboratory and research side of hospital effort. They must be awakened, where necessary, to an intelligent conception of the real value, to the hospital and the community, of the hospital laboratory as a factor in the elucidation of the problems of disease.

4. Pearce, R. M.: The Hospital Laboratory — Its Purposes and Methods, Mod. Hosp., 1916, vi, 158.

THE SOURCE AND CRITERION OF COLOR IN CERTAIN FOODS

It is a familiar observation that animal fats and therefore tissues or organs rich in fat may be more or less colored so that they assume yellow hues of varying intensity. To the lipochrome or pigment responsible for this coloration the name lutein was early applied.[1] Even in recent textbooks, one reads that, dissolved in the fat of the egg yolk, for example, is the yellow coloring matter lutein.[2]

Through a series of laborious investigations, among others by Schunck, Willstätter and by Palmer and Eckles[3] in this country, it has become clearly established that the natural yellow pigment which characterizes the milk fat, body fat, corpus luteum and blood serum of the cow is physiologically, as well as chemically, identical with the carotin of the chloroplastid, and depends on the presence of this pigment in the food for its presence in the tissues, fluids and secretions of the animal body. The yellow pigment in the egg yolk, on the other hand, has been identified from the chemical standpoint as xanthophyll, related to the colored compound of similar name occurring in plants. A small quantity of carotinlike pigment seems to accompany the xanthophyll in the once-designated lutein of the egg yolk. The yellow colorings of organs or tissues rich in fat are thus evidently associated with two characteristic pigments having specific properties.

Palmer[4] of the University of Missouri has lately added new facts to demonstrate the identity of these yellow animal pigments with the carotin and xanthophylls of plants. In the cow, and thus in beef fat and butter fat, carotin is the predominating fat pigment found. In the hen the other group is present in by far the greater proportion. Feeding tests with laying hens, in which the pigment of the feed was carotin to the relative exclusion of xanthophyll, were with-

1. It is unfortunate that this word has since been appropriated by manufacturers of organotherapeutic products to designate a part of the corpus luteum sold for medicinal purposes. Opportunity for confusion is thus readily afforded.

2. Compare Sherman, H. C.: Food Products, New York, Macmillan Company, 1914, p. 134.

3. Schunck, C. A.: Proc. Roy. Soc., 1904, lxxii, 170. Willstätter, R., and Escher, H. H.: Ztschr. f. physiol. Chem., 1911-1912, lxxvi, 214. Palmer, L. S., and Eckles, C. H.: Jour. Biol. Chem., 1914, xvii, 191; Bulls. 9, 10, 11 and 12, Missouri Agricultural Experiment Station Research, 1914. The Natural Yellow Pigments Occurring in the Body, editorial, THE JOURNAL A. M. A., Sept. 12, 1914, p. 948.

4. Palmer, L. S.: Xanthophyll, the Principal Natural Yellow Pigment of the Egg Yolk, Body Fat and Blood Serum of the Hen: The Physiological Relation of the Pigment to the Xanthophyll of Plants, Jour. Biol. Chem., 1915, xxiii, 261.

out appreciable influence on the amount of pigment carried by the blood serum and deposited in the egg yolk. The feeding to laying hens of rations relatively free from both carotin and xanthophyll resulted in a marked reduction of the amount of this pigment carried by the blood serum and deposited in the egg yolk.

It has proved to be easy to apply the findings of this investigation to the practice of the poultry raiser in the control of the color of the flesh (body fat) of poultry and of the yolks of the eggs during the winter season. Where the fancy poultry trade demands colorless flesh in pen-fattened birds, it is merely necessary to select feeds free from carotin and xanthophyll, particularly the latter. The measure of success already attained in feeding practices of this character are to be attributed to the fact that skim milk or buttermilk comprise the greater proportion of the ration. These feeds are devoid of both carotin and xanthophyll. Where the demand is for yellow eggs throughout the winter months, these experiments find their application in the use of feeds rich in xanthophyll. Yellow corn is particularly suited for this purpose, and is one of the few winter feeds carrying an abundance of the xanthophyll pigment which is carried over into the egg yolk.

Now that by the application of intelligent scientific analysis it has become possible to produce any desired degree of pigmentation of the yolk of eggs or the flesh of poultry (or the fat of milk), one must ask the reason for some of the current restrictions of the market. Palmer reminds us that the consumer demands highly colored yolks in "fancy" eggs throughout the year; and the eggs with pale yolks, so frequently found on the market during the winter months, are the object of much complaint, particularly in cities. Similarly, in some sections of the country the poultry trade demands a highly colored flesh. For the fancy trade, however, the demand is for a flesh with the least color possible. Such dietary whims, like the varying predilection for butter of different hues in different sections of the same country, cannot be defended on any physiologic basis. The color of the fats is not the expression of any unique nutritive excellence, but rather the accidental outcome of the particular group of plant products ingested by the animals at the time they produced the food product sought. In the matter of the color of butter, the prejudice against the pale varieties is rapidly disappearing, especially since the consumers are beginning to appreciate that much of the coloration is usually produced artificially in the creamery rather than by the cow. The superstition of a superior virtue associated with deep yellow butter or deep yellow egg yolks is about as rational as the persistence of the prescription and proscription of meats according to their tints.

MEDICAL EDUCATION AND RURAL COMMUNITIES

The paper on this topic by Dr. Gordon Wilson, published this week,[1] may be taken by some as slightly reactionary in regard to the standards of medical education. This is not necessarily true. In fact, a careful study of the tables presented shows no general cause for alarm. In interpreting the figures, several points must be considered:

In the first place, of the two institutions compared, one has been established for over a century and has a wider dissemination of its alumni than the other, which has been in existence for only about two decades. It is commonly known that a medical college receives a large proportion of its students through its alumni, and that most of those students when they graduate return to their home districts to practice. This doubtless explains why in Table 2 there is so wide a variance between the figures of the University of Maryland and the Baltimore Medical College, which was organized in 1881 — more nearly the time when the Johns Hopkins Medical School was established. In fact, the discrepancy between the figures of the two colleges[2] first named is even more marked than that between the figures of the Baltimore Medical College and the Johns Hopkins University, Medical Department.

In the second place, Dr. Wilson's comparison of the University of Maryland is with one of the few colleges in the United States which hold to an extremely high entrance requirement. Indeed, it is not surprising to learn that comparatively few graduates of these schools are found outside the large cities or functioning as ordinary practitioners in rural districts. The results of comparisons with such schools, therefore, do not necessarily indicate a danger of a dearth of physicians in rural districts or anywhere else, since there is no probability that so extreme a requirement for admission to medical colleges will ever be given general adoption throughout the United States. The results would be more worthy of serious consideration had Dr. Wilson compared the figures of the University of Maryland with those of another medical school which had been in existence a more nearly equal length of time, which had alumni as widely distributed, and whose standard for admission for the last ten or more years had been two years of college work rather than the degree requirement.

That there is no immediate danger of a dearth of physicians, furthermore, is evidenced by the present enrolments of medical students. Although the total number of graduates each year has been gradually diminished through the adoption of higher entrance

1. Wilson, Gordon: Medical Education with Reference to Rural Communities, THE JOURNAL A. M. A., this issue, p. 1073.

2. In Table 2, Dr. Wilson shows that of the 1,225 graduates of the University of Maryland School of Medicine in the ten years, 140 (or 11.4 per cent.) located in rural Maryland, while of the 1,330 graduates of the Baltimore Medical College, there were only 31 (or 2.3 per cent.), and of the 965 graduates of Johns Hopkins Medical School, 4 (or 0.4 per cent.) located in rural Maryland.

standards and the reduction in the number of medical colleges, it is apparent that the pendulum is about to swing back, when the number of graduates will again show an increase. This is evident since the enrolment in freshman classes in the majority of medical schools shows a decided increase over that of a year ago. It is significant to note, also, that the increase is more marked in the institutions which have adopted the requirement of two years of premedical college work.

In regard to the rural districts, as set forth in the report of the Carnegie Foundation on this subject, the existence of low standard medical colleges for thirty or more years did not succeed in forcing many practitioners to those districts. With the advent of the telephone, the automobile and better improved roads, rural localities are bound to obtain better medical service. The wider dissemination of better trained physicians will carry with it a wider knowledge of the methods by which diseases may be prevented. This will make the mortality figures, referred to by Dr. Wilson, compare more favorably with the figures in foreign countries. Certainly the public, whether living in cities or in rural communities, will be benefited by having better medical service.

Current Comment

SUGGESTED CHANGES IN THE MEDICAL CURRICULUM OF GREAT BRITAIN

A recent editorial[1] in the *British Medical Journal* deplores the fact that graduates of English universities, not excepting Cambridge and Oxford, are often totally ignorant in even the elements of science and lacking in the intellectual training which it affords. It also refers to a plan proposed by Sir William Osler which would result, not only in a more general knowledge of the sciences, but also in materially shortening the time devoted to medical instruction. Dr. Osler proposes that the preliminary sciences, physics, chemistry and biology, be taught to students in their sixteenth and seventeenth years, since he believes that at that time the majority of those looking to medicine have already selected their life work. That would enable the student to enter the university at the age of 18 and begin at once the study of physiologic chemistry, physiology and anatomy. In the university the student would take two years of laboratory subjects in medicine and two years devoted to clinical subjects—similar to the four-year course at present given in the United States. This would enable him to graduate in medicine at the age of 22 or 23. In commenting on this plan the editorial calls attention to the complaints that the medical curriculum is already overcrowded. That difficulty could be offset, however, as it is being met in the United States, by reorganizing the curriculum and retaining only those subjects which are of most importance; by limiting the time devoted to each subject in accordance with its relative importance, and by adopting a method of teaching whereby the student learns how to study and becomes acquainted with the various sources of information. This is better than merely memorizing a large quantity of medical facts, or attempting to cover all the subjects in the wide field of medicine. All this indicates that there is still room for improvement in medical education in England, and that, by comparison, American medical education is being developed along proper lines.

1. Education Today and Tomorrow, Brit. Med. Jour., Jan. 16, 1916, p. 101.

FACTS FOR PROSPECTIVE MEDICAL STUDENTS

Included in the statistics published this week are two tables which give information of extreme importance to prospective medical students. Before he selects a medical school, the student should know whether it is recognized by all state licensing boards — whether a diploma from that medical school will admit him to the examination for the license to practice in any state of his choice. He should note in Table D[1] that only forty-two medical colleges furnish qualifications which are acceptable in all states, and that the diplomas of thirty-one medical colleges are not acceptable as a qualification for the license in from thirteen to thirty-three states. Before entering on the study of medicine, also, the student should make sure that he has obtained enough preliminary education to make him eligible to receive the license in any state of his choice. It is important for him to examine Table L[2] and note that twelve states[3] now require that the applicant before beginning the study of medicine, in addition to a four-year high school education, must have completed two years of collegiate work, and that to secure a license in nineteen other states,[4] besides the high school course, he must have completed one year of collegiate work. Ignorance regarding these matters may result in a lifelong handicap. The time for the student to make up any deficiencies in preliminary education is, naturally, before he enters a medical school. Certainly he will not care to enter an unrecognized medical college when in the same time and possibly for even less money he can obtain his training in one of the best equipped medical schools. There is no dearth of high grade and well conducted medical colleges that are in position to furnish the student with a training that will enable him to perform the responsible duties which he will later assume.

INCREASED MEDICAL STAFF IN THE ARMY

The House, debating the bill for the reorganization of the army, brought before it by the House military committee, has adopted an amendment granting a provision asked for by the surgeon-general of the army providing for seven medical officers per thousand of

1. Pages 1106 and 1107.
2. Page 1114.
3. Alabama, Colorado, Indiana, Iowa, Minnesota, New Hampshire, New Jersey, North Dakota, Oklahoma, South Dakota, Virginia and Wisconsin.
4. Arkansas, California, Connecticut, Illinois, Kansas, Kentucky, Louisiana, Maryland, Michigan, Mississippi, North Carolina, Pennsylvania, Rhode Island, Texas, Utah, Vermont, Virginia, Washington and West Virginia.

line troops. Such a step is an advance in medical organization. It is in response to the achievements of military hygiene and to the appreciation, by the public at large, of the economic value of sanitation to which it has been educated within the last decade. The work of the Dodge commission, which investigated the conduct of the war with Spain, still bears fruit. The reorganization of the Medical Department in 1908 was based largely on the results of this report, and the provision affecting the personnel also finds its warrant in this report. The determination of the strength of the personnel on a percentage basis is eminently a correct one, and in any increase in the army which might occur, automatically carries with it a proportionate increase in the Medical Corps. Even the pacifist can have no objection to the increase of the scientific and noncombatant corps, charged, as it is, with the conservation of human life in the army; the militarist and economist certainly should welcome any agency which conserves the physical well-being of the trained soldier. That an efficient and sufficient Medical Department can do this, and does do this, is being demonstrated today in Europe. Indeed, it is a question whether any people as intelligent as those of the United States would again tolerate, even for a few brief weeks, the conditions which prevailed in the mobilization camps in the United States during the Spanish War. The sanitary era has arrived, and the action of the military committee is merely recognition which has arrived in the army, as well as in civil life. This is something in which the medical profession of the country at large is vitally interested. It believes that the lessons of the Spanish War should be fully considered in any reorganization of the army.

COEDUCATION IN MEDICINE

It is reported that the trustees of Columbia University have voted to admit women to the College of Physicians and Surgeons. Columbia is the third large medical school which recently has changed a policy of many years and opened its doors to women students. About two years ago similar action was taken by the School of Medicine of the University of Pennsylvania, and last year by the School of Medicine of the Tulane University of Louisiana. The idea of granting equal opportunities for the two sexes in medical schools is apparently gaining. Over forty years ago the University of Michigan admitted women students to its courses in medicine; practically all other state universities followed. From the time of its organization in 1893, the Medical Department of Johns Hopkins University has admitted women. In New York City the Women's Medical College of the New York Infirmary closed its doors only after Cornell University had established its medical school and admitted women students — in 1898. In 1902, Rush Medical College, which had formed a close affiliation with the University of Chicago, became coeducational. At the present time sixty-three medical colleges in this country admit both sexes.

ALCOHOL AND IMMUNITY AGAIN

Concerning the effect of alcohol on resistance to infection, which was recently commented on in THE JOURNAL,[1] it is of interest to note that Konrádi[2] has found that comparatively few antibodies against cholera germs developed in four persons who consumed alcohol daily in fairly large quantities, and who had been given protective inoculation against cholera. Konrádi refrains from drawing any general conclusions from these observations, which he made in the course of a study on the formation of specific antibodies after anticholera inoculation of about 1,400 persons. He mentions Laitinen's work showing lowering of resistance to infection by the prolonged administration of alcohol to animals; Pampoukis' observations that alcoholics are not favorable subjects for inoculation against rabies, and a recent report of the activities of the Pasteur Institute in Budapest during the first twenty-five years of its existence, in which Székely points out that alcoholism is a condition in which the virus of rabies may remain active in spite of the usual antirabic inoculation treatment. These empiric results are not without significance, as they are in harmony with the general bearing of the experimental results mentioned in the previous comment.

RECENT GRADUATES AND THE QUALIFICATION OF THE NATIONAL BOARD OF MEDICAL EXAMINERS

Recent graduates of medical colleges and those about to graduate should carefully consider the advisability of taking the examination proposed by the National Board of Medical Examiners and securing the certificate to be granted by that board. Although at present nine state boards are said to favor the recognition of the certificate granted by the national board, nevertheless, until after an examination has been held, it cannot be stated absolutely that any board will so recognize it. Considering the character of the men who constitute the personnel of this board, however, the prospects for a wide, if not general, recognition of its certificate are good. The qualification of this board is quite certain to be given recognition by the medical departments of the United States Army, of the Navy and of the Public Health Service, if an increase of the medical corps of those services becomes essential. It is probable also that the qualification from the national board will eventually provide the basis for a wider recognition of American medical graduates in other countries. To pass an examination such as is proposed by the national board is naturally less difficult for one who has just completed his medical training than it is for one who has been in practice for several years. The possible benefits to the holders of the certificate from this board are so many that the recent medical graduate may later have occasion for regret in case he does not take the examination at the time when he is best prepared for it.

1. Alcohol and Immunity, Current Comment, THE JOURNAL A. M. A., March 25, 1916, p. 962.
2. Konrádi: Ueber den Wert der Choleraschutzempfungen, Centralbl. f. Bakteriol., I, O., 1916, lxxvii, 339.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

DISTRICT OF COLUMBIA

Memorial to the Red Cross Founder.—A mass meeting was held, March 26, to further the movement looking toward the erection in Washington of a suitable memorial to Clara Barton, founder of the American Red Cross.

Demands Improvement at the Washington Asylum Hospital.—The Monday Evening Club, a public welfare organization, is strongly urging the enactment of legislation looking toward the improvement of the Washington Asylum Hospital. The present accommodations were provided when the institution was an adjunct to the District Workhouse and the District Poorhouse, and are generally conceded to be disgracefully inadequate and antiquated.

HAWAII

Baby Week.—The third week in April has been set as Baby Week in Honolulu, and much interest is being aroused through both the English and Japanese press.

Addition to Sanatorium.—The heirs of the late Alexander Young, who was instrumental in founding the Leahi Home, have just completed and furnished, at a cost of $16,000, an additional building as a memorial to Mr. Young and his wife. The building has accommodations for twenty patients and contains also nurses' quarters, examining rooms and executive offices.

School Inspector Appointed.—Dr. Lawrence Leslie Patterson, who has been making a special study of public health at the University of California, has been appointed city medical inspector of Honolulu by Dr. John S. B. Pratt, president of the Territorial Board of Health. Dr. Patterson will be assisted in his work by one whole time nurse and a staff of ten nurses.

ILLINOIS

Personal.—Dr. David B. Penniman, Rockford, is reported to be critically ill with phlebitis in the Rockford Hospital. ——Dr. Edgar D. Smith, Springfield, was operated on for appendicitis in St. John's Hospital, March 24.——Dr. Richard F. Marrs, Sciota, who underwent operation in the Phelps Hospital, McComb, a few weeks ago, has returned home.——Dr. Frank Weld, Belvidere, fractured his arm by a fall on the ice, recently.

Intern Examination.—The Illinois State Civil Service Commission announces that it will hold an original intern examination at various places in the state, May 6, for the position of intern in the Illinois Charitable Eye and Ear Infirmary, Chicago. This position is open to men and women over 21 years of age, citizens of the United States, who need not be residents of Illinois. The position carries no salary, but includes maintenance. The duties involve assistance and work under supervision in clinics at the infirmary, Chicago, where more than 25,000 cases were handled during the last year. A license to practice medicine in Illinois is required and this year's graduates will be admitted to the examination.

Chicago

Personal.—Dr. Charles P. Caldwell has been made a member of the directorate of the Municipal Tuberculosis Sanatorium, to succeed Dr. Theodore B. Sachs.——Dr. Adam Szwajkart has resigned as a member of the state board of health.

Physicians Resign from Sanatorium Staff.—Drs. Oliver S. Ormsby, James A. Harvey, Elmer L. Kenyon, Robert H. Herbst, Harry E. Mock, Jesse R. Gerstley and Rachelle S. Yarros have resigned from the consulting staff of the Municipal Tuberculosis Sanatorium.

New Buildings for Sanatorium.—At the meeting of the executive committee of the consulting staff of the Municipal Tuberculosis Sanatorium, and the board of directors and superintendent, March 20, it was decided to recommend the expenditure of $500,000 for new buildings, to increase the resident staff of physicians and to appoint standing committees on sanitation, buildings, statistics, dispensaries, nurses and social survey.

Chicago Physicians Down State.—At a joint meeting of the Scott and Clinton counties (Iowa) medical societies and the Whiteside County (Ill.) Medical Society held at Clinton, March 24, Dr. Joseph B. Miller, Chicago, delivered the principal address.——Dr. Ernest E. Irons was the speaker of the evening at the meeting of the Freeport Academy of Medicine and Surgery, March 21. His subject was "Practical Therapeutic Application Based Upon Recent Knowledge of Infectious Diseases."——Dr. Arthur R. Elliott delivered an address before the Indianapolis Medical Society, March 21.——Dr. Paul Gronnerud was the guest of honor at a dinner given by the Muskegon-Oceana Medical Society at Hackley Hospital, Muskegon, Mich., March 31. After the dinner Dr. Gronnerud delivered an illustrated address.

IOWA

Personal.—Dr. and Mrs. George W. Frank, Sunbury, have returned after spending the winter on the Pacific Coast and located in Davenport.——Dr. Max W. Emmert, Des Moines, has accepted a position on the surgical staff of the Medical School of the University of Nebraska, Omaha.——Dr. Arthur L. Washburn, health officer of Oskaloosa, has resigned to accept a position in a hospital in Scotland.——Dr. William L. Becker has been elected president of the board of education of Dubuque.

Hospital Notes.—At a meeting of the board of trustees of St. Luke's Hospital, Davenport, March 22, the location of the new building which, it is expected, will be erected as a result of the ten-day campaign to raise $125,000 for the institution, was discussed.——The residence of Dr. Ralston W. Sleeter, Rockford, is being remodeled for use as a hospital.——Estherville is to have a new hospital to be built at an expense of about $7,500. The building will have accommodations for about twenty patients.——The Atlantic Hospital Association announces that work will commence in the spring on the new building for the institution to cost $25,000.

MARYLAND

Tuberculosis Commission Bill.—A bill has been introduced into the state legislature to provide for a state wide unpaid commission on tuberculosis to be known as the Maryland Tuberculosis Commission and to consist of the governor, secretary of the state board of health, and six others to be named by the governor and confirmed by the senate. This commission is to make proper provision for all tuberculosis hospitals receiving state aid and to furnish accommodations for colored persons suffering from the disease. The bill appropriates $120,000 for buildings; $40,000 for maintenance, and $50,000 for the maintenance and expenses of the commission.

Personal.—Dr. J. McPherson Scott has been reelected mayor of Hagerstown for the fourth consecutive term.——Dr. Charles W. Mitchell, Baltimore, who has been seriously ill with pneumonia, is reported to be greatly improved.——Dr. John C. Hemmeter gave the last of four receptions to the students of the graduating class of the Medical School of the University of Maryland and the College of Physicians and Surgeons, at his house, March 23, when he made an address on "Goethe as a Naturalist."——Dr. Joseph C. Bloodgood, Baltimore, delivered an address at the quarterly luncheon of the California Academy of Medicine, San Francisco, March 29, and before the Commonwealth Club, April 1, and will deliver an address at the meeting of the Medical Society of the State of California, all on the subject of cancer. ——Dr. William H. Welch delivered a lecture before the Book and Journal Club of the Medical and Chirurgical Faculty of Medicine, March 22, on "The Development of Medicine in the Orient."——Dr. Henry Mills Hurd, Baltimore, gave a dinner at the Maryland Club, March 25, to members of the board of trustees of Johns Hopkins University and a number of prominent physicians of the city to mark the fiftieth anniversary of his graduation in medicine.——Assist. Surg.-Gen. Henry R. Carter, U. S. P. H. S., gave a lecture recently before the medical students of the University of Maryland on "Yellow Fever."

MASSACHUSETTS

Personal.—Dr. Jeremiah J. Daly has been appointed town physician at Andover.——Dr. George P. Twitchell, Greenfield, has been renominated as medical examiner (coroner) of Franklin County.

Alumni of School for Health Officers Receive Appointment.—Dr. H. H. Mitchell has been appointed bacteriologist of

the Indiana State Board of Health.——Dr. Ralph W. E. Cole has been reappointed health officer of York Village, Me.——Dr. Stanley H. Osborn has been appointed district health officer by the Massachusetts State Department of Health.

Merging State Boards.—A special committee of the Massachusetts legislature has recommended a central administrative bureau for the state boards of registration in medicine, dentistry, pharmacy, nurses, optometry, veterinary medicine and embalming. The boards will be continued for the examination of candidates, but all clerical work will be done in the new central bureau. The paid secretaries of all boards, except medicine and pharmacy, are to be dropped. The change is expected to save from $10,000 to $12,000 per year in salaries and clerical expenses and at the same time simplify the system of records.

MONTANA

Personal.—Dr. Jed B. Freund, Butte, has been appointed physician of Silverbow County, succeeding the late Dr. Joseph A. Tremblay.

Hospital Items.—At a called meeting of the trustees of the Bozeman Deaconess Hospital, March 22, it was decided that a new building be erected for the institution with twice the capacity of the present hospital buildings.——At a meeting of the board of directors of the Northern Pacific Beneficial Association it was voted to build a new hospital in Missoula to cost $100,000.

NEW YORK

Personal.—Dr. William J. Books has been appointed supervising physician of the city schools of Schenectady.——Dr. Frederick W. Sears, health officer of Syracuse, has returned after a ten-day trip to Porto Rico.

Health Resort Under State Control.—After a series of conferences between the governor, legislative leaders and the commissioners of the Saratoga Springs Reservation, it has been decided to place the state-owned mineral springs at Saratoga under the supervision of the state conservation commission.

The Quarantine Transfer and Dr. Cofer.—The statements made in The Journal of March 25 that the chances of the cession of the quarantine station of New York to the federal government being very slight, and of the failure to confirm the nomination of Assist. Surg.-Gen. Leland E. Cofer, U. S. P. H. S., as health officer of the port of New York, were incorrect. Correspondents state that the outlook for the transfer of the New York Quarantine Station to the federal government is very good, and that the failure to confirm the nomination of Dr. Cofer was technical and had reference merely to his status as a nonresident of New York state.

Antipneumococcus Serum Ready for Distribution.—The Department of Health Laboratory of Buffalo, through Dr. William G. Bissell, chief of the bureau of laboratories, announces that it has prepared to examine sputum from persons suffering from lobar pneumonia and also to distribute antipneumococcus serum. The methods for this work are those used by Drs. Rufus I. Cole and Alphonse R. Dochez of the Rockefeller Hospital, which divided pneumococci derived from cases of lobar pneumonia into four main types according to the immunologic reactions; namely, differential agglutination reactions with homologous serums, and differences in the protective action for mice of homologous and heterogeneous serums against infection with organisms of the different types. The circular also gives directions for collection of sputum and for the use of antipneumococcus serum.

New York City

Opposition to Night Pay Clinic.—The New York County Medical Society at its meeting, March 27, condemned by resolution, without a dissenting vote, the proposal of the Mt. Sinai Hospital to establish a night pay clinic.

Alcohol Discussed.—At the meeting of the New York Academy of Medicine, April 6, Dr. Francis G. Benedict, director of the Boston Nutrition Laboratory of the Carnegie Institute, delivered an address on "The Investigation of the Influence of Alcohol on Man, With Special Reference to Psychological Effects," illustrated by lantern slides. This address was followed by a paper by Dr. Richard C. Cabot of Boston on "The Relation of Alcohol to Personal Efficiency." The discussion was opened by Dr. Charles R. Stockard, New York, and was continued by Drs. C. E. A. Winslow of Yale University and Drs. Bernard Sachs, Haven Emerson, New York, and Prof. Frederick S. Lee.

Personal.—Dr. Charles H. Richardson, Brooklyn, is seriously ill at Roosevelt Hospital.——Dr. Lewis A. Stimson sailed on the French liner *Rochambeau* for Bordeaux, April 1.——Dr. Simon Flexner has been appointed Cutler lecturer at the Harvard University Medical School for this year.——Dr. Henry W. Wandless has been appointed clinical professor of ophthalmology in New York University and Bellevue Hospital Medical College.——Dr. James J. Walsh is to receive the Laetare Medal, which is annually given by the University of Notre Dame, South Bend, Ind., to a distinguished Roman Catholic layman.——Dr. Harry Plotz of Mt. Sinai Hospital has received a medal for bravery from the Bulgarian government on account of services rendered in stamping out typhus fever in Serbia and Bulgaria.

OHIO

Personal.—Dr. Sidney C. Venable, formerly resident physician at the Cleveland State Hospital, has been appointed assistant superintendent of the institution, succeeding Dr. Lemuel R. Brigman, temporary incumbent.——Dr. Francis C. Tyng has been appointed resident physician of the hospital.——Dr. John G. Frey has been appointed serologist to the bureau of laboratories, Cleveland Division of Public Health.——Dr. Clarence D. Selby, health commissioner of Toledo, has been appointed director of the public health laboratories of Toledo University.——Dr. Clyde E. Ford, Cleveland, has decided not to accept the position of secretary of the state board of health to which he was recently elected, but has accepted a position in New York.——Surg. Clarence W. Will, U. S. P. H. S., in charge of the United States Marine Hospital, Cleveland, has resigned, and his resignation was accepted and took effect March 15. He will enter private practice in Cleveland.——Dr. Albert C. Carney has been elected president; Dr. Wilmer E. Griffith, vice president, and Eugene Griffis, secretary-treasurer, of the Hamilton Antituberculosis League.——Dr. Louis H. Frechtling, Hamilton, has been reappointed medical director of the Antituberculosis League and will be in charge of the dispensary, which will be open on Thursday afternoons from 3 to 5 o'clock.

Cincinnati

Personal.—Dr. Edwin W. Mitchell has resigned as senior visiting surgeon of the Cincinnati Hospital after nearly twenty-five years' service, and has been succeeded by Dr. Louis G. Heyn. Dr. Mitchell was elected president of the *Lancet-Clinic* Company at the annual meeting of directors, March 8.——Dr. Elizabeth I. Adamson, intern in the Cincinnati General Hospital, has been appointed resident physician at the Ohio State Hospital, Athens.——Dr. Roger S. Morris has been elected president and Dr. Wade W. Oliver, secretary, of the Cincinnati Research Society.——Dr. Benjamin K. Rachford will deliver the dedicatory address at the opening of the new Children's Hospital, Chattanooga, Tenn., April 18.——Dr. Philip L. Coulter, a former intern in the City Hospital, who has been doing trachoma work for the government in West Virginia, is a patient in the hospital of Dr. Derrick T. Vail, suffering from acute trachoma.——Drs. John W. Murphy and Martin H. Urner have taken over the eye, ear, nose and throat practice of Dr. Thomas M. Stewart, who has removed to Oconomowoc, Wis., where he is to be one of the staff of the new Edgemoor Sanitarium.

PENNSYLVANIA

Personal.—Dr. Francis M. B. Schram, city bacteriologist of Johnstown, fractured his arm recently while cranking his automobile.——Dr. J. Treichler Butz has been appointed health officer of Allentown and also medical inspector for Lehigh County.——Dr. H. F. Lampe of Altoona has resigned as assistant physician of the Altoona Hospital to take a similar position in Kings County Hospital, Brooklyn.

Philadelphia

Fellowship in Obstetrics for Medical Women.—A fellowship in obstetrics for medical women has recently been established by the Woman's Medical College of Pennsylvania. It carries with it the sum of $1,000 for twelve months' work. It is open to women graduates of any accredited medical college, who has served as intern for at least one year in a hospital with an obstetric service, has spent at least one year in further practice, and who intends to continue in the practice of obstetrics. Other things being equal, the holder of a college degree will receive the preference. Application should be made before June 1, 1916.

Personal.—Dr. Ernest Laplace, who has been professor of surgery and clinical surgery in the Medico-Chirurgical Col-

lege for the last twenty years, has accepted also the duties of professor of principles of surgery and clinical surgery held by Dr. Rodman before his death.——Drs. John A. Brophy and H. Maxwell Langdon have been appointed visiting ophthalmologists to St. Agnes' Hospital.——Dr. John P. Bethel has been appointed first assistant bacteriologist in the bureau of health.——Dr. William Scott Wadsworth completed his seventeenth year as coroner's physician, March 21. During this time he has made between 5,000 and 6,000 necropsies.——Dr. Walter E. Lee has returned after work with the American Ambulance unit in Paris.

WISCONSIN

Exchange Lectures.—Dr. Arthur S. Loevenhart, Madison, delivered a lecture on "Biological Aspects of Oxidation" at Marquette University, Milwaukee, and Dr. Louis M. Warfield of Marquette University spoke on "Essentials of Diagnosis in Internal Medicine" at the University of Wisconsin, March 16.

Personal.—Dr. Cornelius A. Harper, Madison, has been reappointed secretary of the state board of health.——Dr. Urban J. Durner, Milwaukee, who has been working in hospitals in London for several months, has returned to his home.——Dr. Ray D. Boynton has resigned as assistant surgeon at the Wisconsin Veterans' Home, his resignation taking effect April 1.

Sterilization Law a Success.—A second series of operations has been performed on male patients at the Home for Feebleminded, Chippewa Falls, with the result, it is announced, that all the patients have recovered and that the operations have been beneficial. Up to the present time, twenty-five patients have been sterilized. The next series of operations will be made on female patients at the Chippewa Falls institution.

CANADA

Hon. Dr. Roche Honored.—The senate of Western University, London, Ont., has elected the Hon. Dr. William J. Roche, Minnedosa, Man., Canadian Minister of the Interior, Chancellor. Dr. Roche was the first medical graduate of the Western University.

Heads Ontario Hospital in England.—Col. David W. McPherson, Toronto, who was with the first Canadian Overseas Force, and who has lately been in command of the Epsom Convalescent Hospitals in England, has been appointed to the command of the Ontario Military Hospital, Orpington, Kent County. The staff for this hospital sailed some time ago and is in England ready for work, although no patients have as yet been admitted to the hospital.

Queen's Hospital Moving to England.—No. 7 General Hospital, Queen's University, Kingston, Ont., which has been stationed at Cairo, Egypt, has left for England. This hospital corps has been in Cairo since last August, and as there is now very little medical work in that region, it was decided to recall it for use on the western front in France. Reinforcements for the hospital to the number of 154 are already in England.

GENERAL

Railroads Enter Malaria Fight.—An antimalarial conference was held in Memphis, Tenn., March 31, which was participated in by physicians and health officers of Tennessee, Arkansas and Mississippi, and by the Rock Island; Louisville and Nashville; Nashville, Chattanooga and St. Louis; Cotton Belt, and Illinois Central railroads. The Medical Department of the University of Tennessee was in charge of the preparations for the conference.

Southeastern Sanitarians Meet.—The fourth annual meeting of the Southeastern Sanitary Association, consisting of medical men from the Carolinas, Georgia, Florida and Tennessee, was held in Brunswick, Ga., March 23 and 24, under the presidency of C. W. Coker, Hartsville, S. C. The following officers were elected: president, Dr. Watson S. Rankin, Raleigh, N. C.; vice presidents, Drs. Skottowe B. Fishburne, Columbia, S. C.; A. V. Wood, Brunswick, Ga.; Joseph Y. Porter, Sr., Jacksonville, Fla., and William E. Hibbett, Nashville, Tenn., and secretary-treasurer, Clarence E. Smith, Greenville, S. C.

FOREIGN

Prize for Research on Pellagra.—A notice in the *Dermatologische Wochenschrift* states that the Academy of Sciences in Roumania has recently bestowed the Adamachi prize on Drs. A. Babes and V. Busila of Bucharest for their comprehensive report on pellagra in Roumania.

Deaths in the Profession Abroad.—Lieut.-Col. James Stanley Newton Boyd, R. A. M. C., F.R.C.S., England, 1881; senior surgeon to Charing Cross Hospital, London; surgeon in chief of the Fourth London General Hospital; editor of the twelfth edition of Druitt's "Vade Mecum" and the seventh edition of Green's "Pathology and Morbid Anatomy"; one of the first lecturers at the Women's Medical School, London, and an early advocate of the claims of women to be admitted to examinations of colleges and universities; died in London, early in February, aged 59.

WAR NOTES

Gift to American Ambulance.—Dr. J. William White has sent his check for $7,830.42 to the treasurer of the Committee on Philadelphia Wards in the American Hospital in Paris to be utilized for the maintenance of the Philadelphia wards in the American Ambulance, Neuilly. This completes the third subscription of $15,000 toward the maintenance of the Philadelphia wards.

Losses in the Profession.—According to a compilation from the German casualty lists 1 to 450, the losses in the profession in the war amount to 1,164, including 264 killed and 130 who have died from sickness; 148 severely wounded, 411 slightly wounded and 76 missing. The figures include 400 army or navy surgeons, 418 belonging to the reserve forces, 304 assistant surgeons and 42 civilian physicians.

The Harvard Unit.—Dr. David Cheever, Jr., who is in charge of the second Harvard medical unit in France, reached Boston, March 20. He was accompanied by Dr. John L. Bremer of Harvard and Dr. Ernest T. F. Richards of the University of Minnesota, who were obliged to return before the completion of their six months' term of enlistment.——Dr. William E. Faulkner, Boston, has started for France to take charge of the second medical unit.

Aid for Belgian Physicians.—Report of the treasurer of the committee of American physicians for the aid of the Belgian profession for the week ending April 1, 1916, shows no contributions for the week ending April 1, 1916.

Previously reported receipts			$7,941.86
Previously reported disbursements:			
1,625 standard boxes of food at	$2.20	$3,575.00	
1,274 standard boxes of food at	2.30	2,930.20	
353 standard boxes of food at	2.28	804.84	
Total disbursements			7,310.04
Balance			$ 631.82

F. F. SIMPSON, M.D., Treasurer,
5 Jenkins Arcade Bldg., Pittsburgh.

PARIS LETTER

PARIS, March 9, 1916.

The War

THE MEDICAL AND SCIENTIFIC COMMITTEE OF ECONOMIC EXPANSION

A medical and scientific committee for the economic expansion of France and her allies has just been founded at Paris. The first meeting was held at the Faculté de médecine under the chairmanship of the dean, Professor Landouzy. Dr. Bardet is general secretary of the committee, which is composed of the directors of medical and scientific journals: Professors Bourquelot, Gilbert, Langlois, Moureu, Edmond Perrier, Quénu, Albert Robin and Drs. Fiessinger, Janicot and Lucas-Championnière, all of Paris, and Professors Forgues of Montpellier and Lyonnet of Lyons. Similar committees are being formed in Great Britain and in Italy, and Russia and Japan have been invited to take part in the organization.

The purpose of all these committees is to oppose German industries in all the allied countries. Before the outbreak of war, physicians and scientists paid a heavy tribute to German industries. Not only chemical and pharmaceutical products, but also all instruments used by the medical profession, almost all optical and laboratory instruments, and lenses of almost every kind, came from Germany. The attempt now being made is to encourage the allies to produce at home, or, at any rate, to obtain from one another, such supplies as they need in medical and scientific work.

The action of the medical and scientific committees of the allied countries will be threefold: 1. They will endeavor to induce the purchaser (the practitioner or laboratory man) to ask the origin of the objects that he buys. 2. They will carry on an assiduous propaganda among manufacturers to per-

suade them to produce all the articles necessary for the use of laboratories and in the practice of medicine. 3. The committees will keep in communication with each other so that all necessary data, especially catalogues printed in several languages, may be exchanged to keep purchasers informed with regard to production and the firms which are able to supply articles which hitherto have come from Germany.

CAMP JAUNDICE AND THE PARATYPHOID EPIDEMIC AT THE DARDANELLES

Drs. Sarrailhé and Clunet have reported before the Société médicale des hôpitaux de Paris numerous cases of icterus which they observed at Gallipoli. The camp jaundice always appeared under the same conditions, that is, in fatigued troops, confined for several weeks in cramped quarters, and demoralized by poor diet and a trying climate.

In most cases, the jaundice occurred during the course of an epidemic of febrile gastric disturbances or followed such an epidemic; less frequently the icterus immediately preceded such an epidemic. At the Dardanelles, blood culture showed that this was not a mere coincidence but that the jaundice was due to a hepatic localization of a paratyphoid virus. The persisting normal color of the stools, the absence of pruritus, albuminuria and the urobilinuria associated with an elimination of pigment in urine, the diminution of globular resistance, association of bladder and liver reactions, rendered the phenomena extremely interesting.

Dr. G. Paisseau mentioned that cases of jaundice of an epidemic character, which were very numerous among the men of the Dardanelles expedition, belonged to two clearly defined clinical forms: a benign form almost constantly apyretic and a considerably more serious febrile form. The course of the benign form falls in two well-defined periods. There is an introductory phase, characterized by a syndrome of digestive disturbances which generally appear suddenly, then a period of jaundice following the first period after an interval of some days. At the outset, the patient is suddenly seized with vomiting accompanied by constipation and abdominal pains. These symptoms persist for some time, although they tend to become less severe. Between the second and eighth day, generally during the fifth or sixth, the jaundice appears. This jaundice is usually general, is accompanied by deep-colored stools and with a marked and often important increase of splenic dulness. The liver is rarely increased in size and the urine is generally colored brick red. The duration of the jaundice is not longer than from eight to ten days. The patients, after the disappearance of the jaundice, often show an emaciation and a loss of strength lasting for considerable time. The prognosis is good.

In the febrile forms, the disease, in the most clearly defined cases, presents the clinical picture of a typhoid fever, with jaundice. In this form, the frequency of vomiting and nausea, often much prolonged, the absence of decolorization of the stools and often their exhibition of various colors are noticeable. The prognosis is much worse than that of the other form.

BERLIN LETTER

Berlin, Feb. 22, 1916.

Personals

Prof. F. Schenck, the director of the Physiologic Institute at Marburg, died recently, aged 53. Having been a pupil of Schueler's, he originally devoted considerable time to physiologic chemistry. Then, for three years he was an assistant in the Physiologic Institute at Bonn. In 1889 he became a member of the faculty, but remained only one year, for in 1890 he was called to Wurzburg. Here he devoted himself largely to the study of the physiology of muscle and of respiration. He also did some work on the physiology of the eye. Two of his textbooks, "Practical Physiology" and "Essentials of Physiology," are quite well known.

War Contributions of the Berlin Medical Society

The first annual report issued by the curatorium for "war support" of the Association of Physicians of Greater Berlin shows that up to the present year 375,000 marks (about $94,000) had been collected. About one third of this sum was contributed by the doctors themselves; the remainder was given by laymen. Of the 3,220 physicians of Greater Berlin, 983 (30.5 per cent.) contributed. About 30 or 40 per cent. of the total number of physicians are with the troops; therefore an equal number did not contribute to the fund, yet were in a position to do so. Definite plans for the distribution of this money have not been made, but it has been decided that only doctors shall participate in the benefits to be provided. Their widows and children are excluded because provisions have been made for them elsewhere.

Provisions Made for Wounded Medical Students

The command has been issued for the district covered by the eighteenth army corps that all wounded medical students may, on request, be transferred to Darmstadt or Giessen so that they will have the opportunity of attending the lectures at the university or the technical high school. The latter proposes to give vacation courses as well so that soldiers on furlough may put in the time profitably.

Workmen's Organizations, and the War on Venereal Diseases

At a recent meeting of the officials of the largest and most influential of these organizations, the following rules and regulations (which received the approval of the government authorities and of the medical profession) were laid down for the prevention and cure of venereal diseases:

1. To prevent or lessen the increase of venereal diseases, it is ordered that all discharged soldiers affected with such diseases be kept under observation. To make such supervision effective, cooperation between the insured and the medical profession is necessary. Special observation stations will be established.

2. All expenses connected with this work, the cost of establishing stations, and traveling expenses of the insured will be met by the insurance companies. The plan of operation of these stations will be similar to that in force in the first-aid stations of Hamburg. The insured may apply for aid or examination at any station in any district, but must give notice of such intention so that the data on file for his case may be forwarded for record.

3. The doctors assigned to the consultation work must not give treatment. They will advise treatment and order the patient to consult his own physician for that purpose.

4. When such treatment is ordered, the insured must be referred to the sick benefit fund from which the expense of treatment will be defrayed unless he raises objections based on sufficient grounds. In such case the company will defray the expense of treatment.

5. The company will also take charge of the treatment if the patient is not insured against sickness.

Prize Essay on Eugenics

The Berlin Society of Social Hygiene, shortly after the beginning of the war, postponed indefinitely the awarding of the prize for the best essay on "Influence of Social Betterment of Families on Eugenics." The society has decided to award this prize July 31, 1916. It really consists of two prizes, one for 800 marks ($200) and one for 400 marks ($100).

LONDON LETTER

London, March 13, 1916.

War and Human Progress

At Birmingham University, Lord Bryce, the former ambassador to the United States, delivered the Huxley lecture which he entitled "War and Progress: An Inquiry from History How Far War and Peace Have Respectively Contributed to the Progress of Mankind." There had, he said, been two schools of philosophical thinkers and historians, one laying stress on the power of reason and finding in it the chief source of human progress, while the other dwelt on the power of selfishness and passion. Latterly the last-named school had sprung into conspicuous prominence. Teachers had arisen who declared war to be valuable in itself, by no means a necessary evil, but rather a positive good. This doctrine, which saw in war a constant means of human progress, based itself on two lines of argument, one drawn from the realm of animated nature and the other from history. Both lines of argument showed that all progress was achieved by strife. Examining the so-called historical argument, Lord Bryce came to the conclusion that, although a state of war and the habit of preparing for it and delighting in it had, in some cases, been found compatible with progress, there was nothing to show that they had caused it. The races which had been most engaged in fighting had not been those that had advanced most. Materially war was destruction. It tended to create and to exalt a professional class which, whether or not it was well educated, was comparatively insensible to artistic and intellectual influences and pleasure in the moral sphere. It furnished occasion for the display of some virtues in the field, but whether these virtues tended to a moral elevation reacting on the whole nation, and whether that elevation would be visible in the

European nations when this war had ended, were questions on which the war itself would throw a light. A war of aggression stimulated by national pride and ambition might have a different moral effect from one undertaken to repel a wanton attack and to protect the world itself from a menace to the sacred principles of justice and humanity. On a review of the whole matter, war would be found not to have quickened but to have greatly retarded the upward march of man. Progress had been due chiefly to thought. Thought was not helped by war. It was the races that knew how to think rather than the far more numerous races that knew only how to fight that had led the world.

Promptitude in Performing Urgent Operations at the Front

In previous letters I have stated that the arrangements for the treatment of the wounded have been organized in the most complete manner, probably more complete than has ever been achieved before. A striking example is the promptitude with which urgent operations are performed. In answer to a question in Parliament, Mr. Tennant, the under secretary for war, said: "The arrangements in France have the full approval of the consulting surgeons and of others most competent to judge. I have quite recently received a report from Sir Frederick Treves in which he states that in many cases a man in need of a grave operation has found himself on the operating table within three or four hours of his being shot, and that he was informed of cases in which operations on the skull and the abdomen had been carried out within two and a half hours of the receipt of the wound; and he adds that such prompt attention could not be obtained by a wounded civilian in any rural district in England." This is of great importance, as early operation in penetrating abdominal wounds is now the rule. This contrasts with practice in the South African war, in which expert surgeons were unanimous that the best treatment was to disturb the patient as little as possible, give no food for several days, no drink but water, and relieve the suffering by morphin. It was held that the mortality under this treatment was lower than under operation, and that recovery frequently took place even when the intestines were perforated. The mortality in cases of operation was then appalling. This was perhaps largely due to the adverse conditions under which the work was done. Influenced by the traditions of that war, expectant treatment was adopted in all cases of abdominal wounds during the first six months of the present war. The mortality was very high, much higher than in South Africa, and the results of occasional operations at the base hospitals and clearing stations were not encouraging. Within the last six months, however, an effort has been made to reduce the mortality by immediate operation in the most favorable surroundings possible. Experienced operators have been posted at the clearing stations, and arrangements made to expedite the transference of patients with abdominal wounds. Exploratory laparotomy has taken the place of rest and starvation. Saline infusion, a method in its infancy during the South African war, has been largely used to combat shock. It is not possible yet to give the statistics of the results, but surgeons are agreed that a great improvement has been effected.

Striking Decrease of Lunacy in London

A striking decrease in the number of lunatics chargeable to London is recorded in the London county council's return for 1915. Pauper, criminal and private patients for whom the county had to provide accommodation numbered, Jan. 1, 1916, 20,886, compared with 21,539 on the corresponding date in 1915, while the total number of patients (including those in the Metropolitan Asylums Board's institutions, in workhouses, and with relatives or friends) was 28,252, against 29,211. Private patients at the London county asylums have also decreased: Jan. 1, 1916, there were 458 "private list" cases, as against 488 in 1915, and 209 private patients, as against 205. Thus, for the first time since the council became the responsible authority, a decline is recorded in the number of lunatics. The decrease affects both men and women, the figure of 653 being made up of 363 males and 290 females. The ratio of the sexes in the asylum population is 9 males to 11.8 females, so that proportionately there is a greater reduction of males. It was not anticipated that there would be under war-time condition a very large decrease in the occurrence of lunacy, or, at any rate, in the number of cases certified. This appears to be due to a great decrease of poverty, the strain of which is one of the causes of insanity. The reduction of poverty is due to the abundance of employment furnished by war work and the withdrawal of a large part of our male population from civil work to the army.

Association News

THE DETROIT SESSION

Excursion from Chicago by Lake Steamer, with Stateroom While at Detroit

If a sufficient number of people are interested, the Committee on Transportation and Place of Session will make arrangements with the owners of a large, modern lake steamer for a special excursion trip from Chicago to Detroit. The plan is for the steamer to leave Chicago on the afternoon of Saturday, June 10, and to arrive in Detroit on the morning of Monday, June 12, the steamer to remain at Detroit for the 12th, 13th, 14th and 15th, on which date it will leave Detroit, and return to Chicago Saturday, June 17. The schedule arranges for a stop at Mackinac Island of from two to three hours. If a party of 300 persons engages to make this trip, a fare of $35 per capita can be obtained. This fare will include transportation, meals and berth while en route and the use of a room and serving of breakfast while at Detroit. In this way, a comfortable two-day trip in each direction is provided, and sleeping accommodations with breakfast on board is assured during the stay in Detroit. Railroad tickets reading between Chicago and Detroit will be honored on the steamer for transportation on the payment of an additional $15 to cover meals and berth. Those interested in such a boat trip are requested to write directly to the American Medical Association, addressing the chairman of the Committee on Transportation and Place of Session, 535 North Dearborn Street, Chicago.

J. RAWSON PENNINGTON, Chairman.

Deaths

Theodore Bernard Sachs, M.D., one of the most notable workers in the antituberculosis campaign in the United States and until a few days ago superintendent of the Municipal Tuberculosis Sanatorium, Chicago, committed suicide, April 2.

He was born in Dinaburg, Russia, May 2, 1868, and after graduating from the high school at Kherson and studying law for four years at the University of Odessa, came to the United States and located in Chicago. Instead of practicing law, he entered on the study of medicine and was graduated from the College of Physicians and Surgeons, Chicago, the Medical Department of the University of Illinois, in 1895.

After two years as intern in Michael Reese Hospital, he entered general practice, devoting himself especially to diseases of the heart and lungs. In 1901 he was appointed instructor in internal medicine in his alma mater and held this position for four years. From 1913 to 1915 he was attending physician at Cook County Hospital.

His reputation in his chosen field of tuberculosis, rapidly grew and he became medical director of the Edward Sanatorium, Naperville, Ill., examining physician to the National Jewish Hospital for Consumptives, Denver, physician-in-chief to the Chicago-Winfield Sanatorium, Winfield, Ill., founder, secretary and later president of the Chicago Tuberculosis Institute and director of the tuberculosis clinic of the West Side Free Dispensary.

He was a Fellow of the American Medical Association and Illinois Society for the Prevention and Cure of Tuberculosis, and in June, 1915, was elected president of the National Association for the Study and Prevention of Tuberculosis.

In 1909 Dr. Sachs was appointed a member of the board of trustees of the Municipal Tuberculosis Sanatorium. He practically gave up his private practice for several months to study out and perfect an organization for this institution. In 1911 Dr. Sachs was reappointed a trustee and was elected president of the board of trustees of the institution. During this time a system of municipal tuberculosis dispensaries in the various parts of the city was commenced, Dr. Sachs directing the work from the general office of the sanatorium. In May of last year the Municipal Sanatorium was opened.

In this work, which Dr. Sachs believed the fruition of his life endeavor, he labored incessantly, endeavoring to raise the standard of efficiency and to accomplish the greatest

good. Opposition, political in character, soon developed, attacks were made on his administration, and the continuance and persistence of these attacks made his burden too grievous to be borne and on March 20 he resigned.

The last act of his life occurred at the Edward Sanatorium, Naperville, where, unable to bear up under the strain, he took morphin and died from its effects, leaving behind him a pathetic letter to the people of Chicago, which closed with the words "I am simply weary."

Granville Priest Conn, M.D., Wayne, Pa.; Dartmouth Medical School, Hanover, N. H., 1856; aged 84; a member of the New Hampshire Medical Society, and secretary since 1869 excepting during his vice presidency in 1906 and presidency in 1881; for many years a practitioner of Concord, N. H., and a member of the New Hampshire Board of Railroad Commissioners from 1877 to 1881; assistant surgeon of the Twelfth Vermont Volunteer Infantry during the Civil War, and later compiler and editor of the History of New Hampshire Surgeons in that war; lecturer on hygiene in his alma mater from 1886 to 1896 and since that time professor or professor emeritus; city physician of Concord from 1872 to 1876; president of the New Hampshire State Board of Health since 1881; medical director of the Department of New Hampshire G. A. R. since 1889. He moved to Wayne, Pa., a few months ago and died at his home, March 24.

Thomas Davis Davis, M.D., Pittsburgh; Jefferson Medical College, 1870; aged 69; a Fellow of the American Medical Association and a member of the House of Delegates in 1909-1910, 1912 and 1914; for five years a practitioner of Dayton, Ohio, and president of the Montgomery County (Ohio) Medical Society in 1876; lecturer on ophthalmology in Starling Medical College, Columbus, in 1876 and 1877; surgeon to Mercy and St. Francis' hospitals, Pittsburgh, and the Passavant Infirmary; president of the Allegheny County Medical Society in 1892, and later of the Medical Society of the State of Pennsylvania and for several years president of the board of trustees and councilors of the society; died at the home of his son in St. Petersburg, Fla., April 1.

Edward Duggan Payne, M.D., Towanda, Pa.; Jefferson Medical College, 1857; aged 79; who entered the Navy in 1861; became medical inspector with the rank of commander June 29, 1906, and was retired April 13, 1876, with the rank of next higher grade to that held on active list on account of incapacity resulting from an incident of service, after six years and three months' sea service and three years and seven months of shore or other duty; surgeon on the U. S. S. *Congress* when that vessel and the *Cumberland* were destroyed by the *Merrimac* in Hampton Roads in 1862, and later surgeon on the *Hartford*, Admiral Farragut's flagship at the Battle of Mobile Bay; died at his home, March 24.

Francis T. B. Fest, M.D., Port Limon, Costa Rica, C. A.; University of Heidelberg, Germany, 1883; aged 54; a Fellow of the American Medical Association and president of the New Mexico Society for the Study and Prevention of Tuberculosis in 1911; for many years a practitioner of East Las Vegas, N. M., where he made a specialty of tuberculosis. At one time surgeon-general of New Mexico; for the last three years surgeon of the United Fruit Company and in charge of its hospital at Port Limon, Costa Rica; died in that place, March 13.

Gustav Adolf Langmann, M.D., New York City; University of Greifswald, Germany, 1865; aged 73; a Fellow of the American Medical Association; a member of the American Association of Pathology and Bacteriology, New York Pathological Society and New York Academy of Medicine; attending surgeon to the German and Mt. Sinai hospitals and consulting physician to the German Lloyds of New York; founder of the Nurses' Training School of the German Hospital; died at his home, March 27.

Charles Sumner Powell, M.D., Benson, Ariz.; Vanderbilt University, Nashville, Tenn., 1885; aged 61; for many years district surgeon of the Southern Pacific and El Paso and Southwestern railways; and physician to the State Industrial School; died in a hospital in El Paso, Texas, March 18.

Edgar Brenton Henderson, M.D., Marengo, Ia.; State University of Iowa, Iowa City, 1897; aged 43; a Fellow of the American Medical Association; who had been ill with nephritis, was found dead near his home, March 17.

Oliver Madison Atwood, M.D., Washington, D. C.; University of Michigan, Ann Arbor, 1873; aged 68; one of the first colored physicians to practice in Washington; died at his home, March 14, from interstitial nephritis.

Asa Stewart Iglehart, M.D., New York City; New York University, New York City, 1897; aged 46; for two years a member of the staff of St. Luke's Hospital; died in Iquique, Chile, S. A., March 18, from typhoid fever.

William P. Miller, M.D., Calhoun, Ky.; Louisville Medical College, 1894; aged 70; a member of the Kentucky State Medical Association and a Confederate veteran; died at his home, March 17, from heart disease.

Robert H. Hoge, M.D., Hoge's Store, Va.; College of Physicians and Surgeons, Baltimore, 1873; aged 64; for many years chairman of the board of health of Giles County, Va.; died at his home, March 7.

Harry Mathews Gottman, M.D., Evansville, Ind.; University of Louisville, Ky., 1905; aged 33; a Fellow of the American Medical Association; died at Asheville, N. C., March 8, from tuberculosis.

David F. Alsdorf, M.D., Guthrie, Okla.; Albany, N. Y., Medical College, 1855; aged 83; for many years a practitioner of Corunna, Mich.; died at the home of his son in Guthrie, February 15.

Fred H. Bangs, M.D., San Jose, Calif.; Homeopathic Hospital, Cleveland, Ohio, 1880; aged 57; a member of the Medical Society of the State of California; died suddenly at his home, March 13.

George L. Ireland, M.D., Winslow, Ind.; Medical College of Indiana, Indianapolis, 1882; aged 58; a member of the Indiana State Medical Association; died at his home, March 10, from pneumonia.

Adam Griggs Elder, M.D., Columbus, Ohio; Starling-Ohio Medical College, Columbus, 1908; aged 38; a member of the Ohio State Medical Association; died at his home, March 13, from typhoid fever.

Jesse N. Goodson, M.D., Kansas City, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1875; aged 69; for many years a practitioner of Maryville, Mo.; died at his home, March 16.

Mary Winifred Tucker Ward, M.D., Hampton, Neb.; University of Nebraska, Lincoln and Omaha, 1911; aged 34; died at her home, March 6, from heart disease, ten days after childbirth.

Gustav Adolph Krauss, M.D., Jersey City, N. J.; New York University, New York City, 1898; formerly a specialist on tuberculosis; died in the Trenton (N. J.) State Hospital, March 16.

Robert E. Atwood, M.D., St. Louis; St. Louis College of Physicians and Surgeons, 1896; aged 41; was found dead from heart disease in a rooming house in St. Louis, January 2.

John L. Stump, M.D., Charleston, W. Va.; Medical College of Virginia, Richmond, 1888; aged 63; died at Titusville, Fla., March 11, from heart disease.

Nelson Deloss Blood, M.D., Auburn, N. Y.; Bellevue Hospital Medical College, 1874; aged 69; died at his home from heart disease, March 11.

Ransom L. Washington, M.D., Owensboro, Ky.; Meharry Medical College, Nashville, Tenn., 1902; aged 40; died at his home, March 16.

Reinhard K. Keeler, M.D., Harleysville, Pa.; Jefferson Medical College, 1852; aged 85; died at his home, March 15, from senile debility.

Marriages

JAMES BYRON BLAIR, M.D., Winnipeg, Man., to Mrs. Ora B. Mueller of Decatur, Ill., at Terre Haute, Ind., February 10.

HARRY PATTON ST. CLAIR, M.D., to MARY PRISCILLA BROOKE, M.D., both of Butler, Pa., at Pittsburgh, March 1.

THOMAS R. LASWELL, M.D., New Hope, Ill., to Mrs. Mattie Hambleman of Murphysboro, Ill., March 11.

THOMAS ANDREWS HOPKINS, M.D., to Miss Kittie B. Heman, both of St. Louis, March 4.

MORRIS ROBERT ALTMAN, M.D., to Miss Miriam Newmark, both of New York, March 12.

ELIAS G. BROWN, M.D., Allaben, N. Y., to Miss Adelaide Day of New York, March 16.

AUSTIN H. WOOD, M.D., Baltimore, to Miss Zelda Treece of Shy Beaver, Pa., March 16.

CHARLES L. O'BRIEN, M.D., to Miss Eleanor Mahoney, both of Chicago, February 13.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE WINE OF CARDUI SUIT

(*Continued from page 1050*)

March 28, Morning

On March 28, 1916, the Court met, pursuant to adjournment, at 10:30 o'clock. The jury retired while argument was introduced regarding the introduction of evidence. Mr. T. J. Scofield then read to the jury the testimony of Mr. John A. Patten, which was given at Chattanooga, Tenn., and which, pursuant to the agreement of counsel, not only as to this but as to all other competent and relevant matter which was presented in Chattanooga, may be read as evidence in the present trial.

TESTIMONY OF MR. PATTEN AT CHATTANOOGA

Mr. Patten testified in Chattanooga as to the organization of the Chattanooga Medicine Company as follows:

Mr. T. J. Scofield:—(Reading).

Q.—I believe, Mr. Patten, you are one of the plaintiffs in this case? *A.*—Yes.

Q.—And you and your brother, Z. C. Patten, Jr., are the owners of the Chattanooga Medicine Company? *A.*—Yes, sir.

Q.—Or do business under the name of the Chattanooga Medicine Company? *A.*—Yes.

Q.—The Chattanooga Medicine Company is now a partnership? *A.*—Yes.

Q.—And has been I believe you said on yesterday, since 1909? *A.*—September, 1909.

Q.—Prior to that time the Chattanooga Medicine Company was a corporation? *A.*—Yes.

Q.—The partnership has been engaged in the same business in which the corporation was previously engaged? *A.*—Yes.

Q.—The Chattanooga Medicine Company, a corporation, manufactured and sold this Wine of Cardui among other things? *A.*—Yes.

Q.—For how many years? *A.*—Since 1879.

Q.—And you were personally connected with the business since what date? *A.*—1884.

Q.—You become secretary when? *A.*—In 1891.

Q.—And continued to be the secretary and one of the executive officers until the corporation was converted into a partnership by the surrender of its charter? *A.*—Continued as secretary, yes.

Q.—I say as secretary and one of the executive officers? *A.*—One.

Q.—Prior to the time of the surrender of the charter The Chattanooga Medicine Company was quite a close corporation, that is, its stock was owned by a few individuals? *A.*—Immediately before the surrender of the charter it was owned by the two individuals who became the members of the partnership.

Q.—Yourself and your brother? *A.*—Yes.

Q.—For how long prior to the surrender of the charter had you and your brother been the sole stockholders in the corporation? *A.*—Since early in 1906.

Q.—Since early in 1906? *A.*—Yes.

Q.—Who was president of the Corporation at the time the charter was surrendered? *A.*—Z. C. Patten, Sr.

Q.—However, he owned no stock at that time? *A.*—No.

Q.—You yourself were in active charge of the business at that time? *A.*—I was the manager.

Q.—And you had been in charge, active charge of it since early in 1906? *A.*—Yes, sir.

Q.—Of course you were entirely familiar with what was in that preparation and the method in which it was manufactured? *A.*—Yes.

Q.—And you had been for how long? *A.*—Familiar with it from 1884.

Q.—And you also were familiar with the statement made on the labels? *A.*—Yes.

Q.—And the statements made in the literature? *A.*—Well, in a general way. I could not say that I would be familiar with every statement made at every time.

Q.—Who was the supervisor of the literature of that corporation? *A.*—At what time?

Q.—Well, from the time you became in charge of it in 1906 on down? *A.*—E. A. Wheatly.

Q.—Well, of course, after you came in charge of it, you had some supervision over the literature, didn't you? *A.*—I was manager of the whole business.

Q.—The whole business? *A.*—Yes.

Q.—Now, Mr. Patten, I want to call your attention to this placard. Wine of Cardui is what you call this preparation, isn't it? *A.*—Well, that is a part of the name.

Q.—And it has been called Wine of Cardui ever since you have been connected with it, has it not? *A.*—I say that is a part of the name, and has been ever since I have been connected with it.

Q.—It is made under a secret formula, isn't it? *A.*—A formula not published, yes.

Discussion between counsel and the Court is omitted. Questions and answers then followed:

Q.—It is true, is it not, Mr. Patten, that during the entire time that you have been connected with the manufacture of this preparation, it has contained alcohol? *A.*—Yes.

Q.—It now contains 20 per cent. approximately? *A.*—Yes.

Q.—And has contained that amount how long? *A.*—Since about the first of June, 1907.

Q.—How much did it contain before that? *A.*—17 per cent. by volume immediately preceding that.

Q.—For how many years did you manufacture it with 17 per cent.? *A.*—About two or three months.

Q.—How much did it contain prior to the 17 per cent. *A.*—15 per cent. by volume.

Q.—How long did you manufacture it with 15 per cent.? *A.*—About three months.

Q.—How much did it contain prior to the time that you used 15 per cent? *A.*—About 22½ per cent. by volume.

Q.—So that in the early part of 1907, you adopted 20 per cent. of alcohol as the standard of manufacture, and have since continued that proportion approximately? *A.*—Yes.

Evidence was then read regarding the posters showing the label on the Wine of Cardui, and regarding the various issues of the Home Treatment Book. The following questions and answers were then read:

Q.—Who was it you said prepared this Home Treatment Book of 1913? *A.*—E. A. Wheatly.

Q.—Who is Mr. E. A. Wheatly? *A.*—He is in the employ of the Chattanooga Medicine Company, the title being Advertising Counsel.

Q.—Advertising Counsel; is he a doctor? *A.*—No.

Q.—Is he a surgeon? *A.*—No.

Q.—And so Mr. Wheatly, the Advertising Counsel, prepares the articles of the Chattanooga Medicine Company describing the female anatomy and recommending cures for female diseases, is that correct? *A.*—Yes.

Q.—Of course, that is all done with your knowledge as one of the members of the firm? *A.*—Yes.

Q.—Now, Mr. Patten, this preparation is called and always has been called "Wine of Cardui" has it not? *A.*—That is a part of the name.

Q.—Well, is not that the way in which the name is frequently given in the literature? *A.*—Very frequently.

Q.—Wine of Cardui. You know what wine is, Mr. Patten, don't you? You know the legal definition of wine? *A.*—No, I don't know the legal definition of it.

Q.—Well one of them is "the fermented juice of the grape"—

Objection to this question was made and sustained. Mr. Scofield then continued reading:

Q.—This preparation is not the juice of the blessed thistle, dissolved in wine, is it? *A.*—There is no grape juice in it.

Q.—Now just answer the question. It is not the juice of carduus benedictus dissolved in wine, is it? *A.*—I don't know what you mean by "the juice of carduus benedictus."

Q.—Well, is it anything dissolved in wine? *A.*—Not grape juice wine.

Q.—Is there any wine in it? *A.*—Not as you are speaking of wine.

Q.—Well, now, as you are speaking, is there any wine in that preparation within the definition of the word "wine" with which you are familiar? *A.*—I understand "wine" to be a synonym for "extract" and it is used in that connection, so far as it is descriptive, but it is used here as the trade mark name of the preparation.

Q.—No, I am not asking you that. That is not an issue in this case. Is there any wine in this preparation within any definition of the term "wine" with which you are familiar? *A.*—Not except as the alcohol is in it.

Q.—You don't mean to say that you regard alcohol and wine as synonymous do you? *A.*—No.

After argument regarding the introduction of evidence concerning the alcohol in Wine of Cardui, Mr. Scofield continued reading:

Q.—Well, it is a fact, is it not, Mr. Patten, that no claim is now made on the labels or on the cartons in which this preparation now is sold, that it will cure anything? *A.*—The word "cure" so far as I see from the wrapper (and that is in harmony with my own recollection of it) does not appear there.

Q.—So that the representations as to what this preparation will do in the way of curing people, are now confined to the advertisements and outside literature; that is true, is it not? *A.*—Well, there are statements on the paper that you have shown me regarding what it is recommended for but not—I said the word "cure" did not appear there.

Mr. T. J. Scofield:—That is all of the first part of the examination. He was subsequently recalled, if the Court please, for further cross examination, and I will read that.

Mr. Hough:—Further cross examination?

Mr. T. J. Scofield:—Or further direct examination, on behalf of the defendant.

Mr. T. J. Scofield:—(Reading).

Q.—Mr. Patten, how many of those Home Treatment Books are printed and circulated each year? A.—A comparatively limited edition, between 25,000 and 50,000 a year. They are not sent for general circulation; only in response to requests for them, or in response to a request for advice, when they accompany the reply. They mostly go to those who are already taking the medicine.

Q.—Well, when you send out a letter, when you send out the Home Treatment Book, you send a letter along with it, do you not, a form letter? A.—Yes, sir.

Q.—How many copies of the Birthday Almanac do you print each year? A.—I cannot state exactly, but more than ten million.

Q.—And they are circulated all over the United States? A.—To a certain extent, not so much in the Northeastern states.

Q.—Wine of Cardui is kept for sale, is it at drug stores generally? A.—Yes.

Q.—And you advertise in your literature that it can be bought at any drug store? A.—Yes.

Q.—It is also kept for sale at country stores, general merchandise stores, is it not? A.—A good many, not so very much.

THE COURT:—Let me ask one question at this point because it was not covered in the opening statement: Is the Wine of Cardui sold direct from the Company to the consumer, or is it only from the drug store or the general store?

Mr. T. J. Scofield:—Either way; it is sold direct from the Company, if they cannot get it at the drug store.

THE COURT:—But you can buy it from the Chattanooga Medicine Company.

Mr. T. J. Scofield:—Yes, sir.

Argument was then made as to the introduction of testimony in the Chattanooga trial on the formula. Mr. Scofield then continued reading:

Mr. T. J. Scofield:—(Reading).

Q.—Now I want to ask you when it was that viburnum prunifolium or black-haw was first put into this preparation as one of its ingredients. A.—In the latter part of 1906.

Mr. T. J. Scofield:—Then, if the Court, please, Mr. Patten asked for the privilege of making an explanation, which the court granted, and I will read it although it is incompetent.

(Reading) It has been testified to here that my brother and myself came into the possession or control of the business early in 1906. A very short time after that I consulted Dr. J. W. Mallett, a teacher of one of the branches of chemistry at the University of Virginia, in connection with the making of the preparation. I gave him two commissions; to eliminate, to reduce or eliminate the alcohol if he could, or reduce it to the lowest possible amount that would keep the medicine from spoiling if we could not eliminate it entirely, and to suggest any other change in the preparation that he could suggest that would be of benefit to it. He worked on it for two or three months and growing out of the repeated consultations and his suggestion, finally viburnum prunifolium was included in the medicine.

Q.—Doctor Mallett was a chemist? A.—And physician.

Q.—Is he a physician as well as a chemist? A.—Yes.

Q.—Then that was you said in the latter part of 1906? A.—Yes.

Q.—What amount of viburnum prunifolium,——

Mr. Hough:—I objected to that.

Mr. T. J. Scofield:—Yes, that is objected to. That last question which I started to read was withdrawn.

(Reading) Is this the carton, Mr. Patten, in which Wine of Cardui was put up and sold before you put black haw in it?

Mr. Hough:—That raises another question, your Honor. In this investigation they are limited and should be limited to what Mr. Patten was doing at the time this libel was printed. He is charged with doing something at that time which constitutes a fraud. Now, what he did ten years before is not material.

THE COURT:—Not unless it is followed up by showing that he continued to do the same thing.

Mr. Walker:—That does not meet it.

THE COURT:—The only way is to prove what he was doing at the time the Medical Association brought out their publication. Now I do not know—if they don't connect it up with the period of the libel, of course it is not competent here.

Mr. Hough:—Well, we will see how they connect it up.

THE COURT:—I will strike it out if they don't connect it up.

Mr. T. J. Scofield:—(Reading). I have not those cartons here, but they will be produced later.

A.—No, not immediately before.

Q.—How long before was this carton used? A.—About a year.

Q.—And its use was discontinued at what time? A.—In February, 1906, according to the best of my recollection.

THE COURT:—I will say further that what was done prior to the so-called libels, may have some bearing on the mental attitude of Mr. Patten.

Mr. Hough:—Where that is the effect, of course, it is competent.

Mr. T. J. Scofield:—(Reading).

Q.—In February, 1906, you discontinued the use of this carton and substituted another in the place of it? A.—Yes, the directions for the change, the changed plate was ordered in January, 1906. I say I do not remember the first day that it was printed from the new copy, but before the end of January, 1906, another wrapper was prepared.

Q.—So that during the entire time that this carton was used, there was no viburnum prunifolium in the preparation? A.—Up to that, January, 1906, no.

Q.—In the carton that was adopted in the place of this one, the words "certain cure" on the front of the carton, were eliminated and the word "recommended" was inserted in place of the words, "certain cure?" A.—Yes.

Q.—Isn't this a copy of the circular that was sent out in each carton containing a bottle of this preparation up to the time the use of this carton was discontinued? (Handing paper to witness). A.—I could not testify to that, except that it appears to have been one of the circulars sent out at some time.

THE COURT:—I think it would be very much better if you had one of those cartons here so that the Jury could understand the question as put.

Mr. T. J. Scofield:—I quite agree and I will undertake to have them in right after dinner. I have not got them here.

Mr. Hough:—You are referring to the left-hand picture on the placard, as I understand it.

THE COURT:—If that is there, you may proceed.

Mr. Hough:—In other words, the point is that the placard says that that change was made after the Pure Food Law was passed and Mr. Patten says it was made before the Pure Food Law was passed, and without any reference to it.

Mr. T. J. Scofield:—(Reading).

Q.—Mr. Patten, have you ever had any chemical or medical education? A.—No.

Q.—Has you brother, Z. C. Patten, Jr.? A.—No.

Q.—You have already stated, I believe, that Mr. Wheatly is neither a physician nor a chemist nor a surgeon? A.—He bears no degree in either of those branches. He has studied both medicine and chemistry.

Q.—He never practiced either, did he? A.—Well, of course not as a physician or surgeon. I think he did some work in England as a chemist.

Q.—When did you say he went into your employ? A.—I did not say so far as I remember.

Q.—I thought you stated here the other day, when you were on the stand. A.—Before 1906, perhaps 1903 or 1904.

Q.—Prior to that time, what business had he been engaged in? A.—Connected with other Medicine concerns.

Q.—Was he not running some sort of a printing establishment here in Chattanooga? A.—Not before that time.

Q.—Not before that time? A.—No.

Q.—Was he not engaged in a sort of an advertising business agency? A.—Yes, after he came with us he was doing so.

Q.—Wasn't he before that time? A.—No.

Q.—When you commenced to use viburnum prunifolium in this preparation, did you use the bark of the stem or the root? A.—Of the tree? The stem.

Q.—Of the stem and not of the root? A.—No, I think not.

Mr. T. J. Scofield:—Now, there is a question or two that you may wish to read, of yours.

Mr. Hough:—(Reading).

Q.—Did I understand you to state that the statements on here, on this label were printed in February, 1906? (Counsel refers to reproduction of label on Dowling poster.) A.—January or February.

Q.—1906? A.—Yes.

Q.—When was the Pure Food Law passed, if you know? A.—It was passed June 30th, 1906, effective January 1st, 1907.

Q.—So that the change was not from the left hand label to the right hand label, but from another label which came between? A.—Why, the Pure Food Law had nothing to do with the change from that label there that you mention. It was changed six months before the law was passed.

Mr. T. J. Scofield:—(Reading). Q.—You were asked about these changes in the cartons. I will ask you whether or not this photograph which I hand you, shows the three cartons which were used by you during three different periods? A.—That is the only change that has been made in it.

Mr. T. J. Scofield:—These are the cartons, your Honor, that is they are pictures of the same cartons but they are not the ones that were presented to Mr. Patten while he was on the witness stand.

THE COURT:—Show them to counsel and if they are facsimile perhaps he will agree to them.

Whereupon the further hearing of said cause was adjourned until 2 o'clock the same day, March 28, 1916.

March 28, Afternoon

The Court met, pursuant to recess, at 2 o'clock p. m.

Mr. T. J. Scofield handed to the jury photographs of the cartons and the testimony of Mr. Patten in the Chattanooga trial, relative to the various changes in the cartons, was read to the jury by attorneys for the plaintiff and the defendant.

DEPOSITION OF MISS GRACE GILBERT

Attorneys for the Association then offered in evidence the testimony of Miss Grace Gilbert, a witness called by the defendant at Chattanooga. Mr. T. J. Scofield read the testimony as follows:

Q.—What is your name, please? *A.*—Miss Grace Gilbert.

Q.—What is your occupation? *A.*—I am head of the Ladies' Advisory Department, Chattanooga Medicine Company.

Q.—Head of the Ladies' Advisory Department, Chattanooga Medicine Company? *A.*—Yes, sir.

Q.—How long have you filled that position, Miss Gilbert? *A.*—About eight years.

Q.—Eight years? *A.*—Yes, sir, about eight years.

Q.—What are your duties as head of the Ladies' Advisory Department? *A.*—Well, when the letters and symptom blanks come in, I answer them and direct the work.

Q.—Are you a physician, Miss Gilbert? *A.*—No.

Q.—Have you ever had any medical education? *A.*—I know a little about anatomy, and I have a special liking for the work I do.

Q.—You have never taken any medical course at any school? *A.*—No.

Q.—You don't profess to be a physician? *A.*—No.

Q.—Do you know the difference between the symptoms that would attend a prolapsus of the uterus and menorrhagia? *A.*—No.

Q.—I believe you stated, Miss Gilbert, that, when these examination symptom blanks are returned or received at the office of the Chattanooga Medicine Company, they are turned over to you? *A.*—Yes, sir.

Q.—What do you do with them? *A.*—We answer them.

Q.—You answer them personally? *A.*—Yes, and my assistant.

Q.—You and your assistant? *A.*—Yes, sir.

Q.—Who is your assistant? *A.*—Miss Jennie Lee.

Q.—Do you have any supervision over the answers that she sends? *A.*—Yes, sir.

Q.—You direct her what answers to send? *A.*—Yes sir. She only answers blanks, examination symptom blanks.

Q.—What? *A.*—She only answers examination symptom blanks.

Q.—Does she answer all the examination symptom blanks? *A.*—Yes, sir.

Q.—Now, does she know anything about what kind of trouble certain symptoms will indicate? *A.*—Yes, sir.

Q.—How does she get that? *A.*—I give her the information that I use myself.

Q.—Where do you get it? *A.*—I get it from the Home Treatment Book, and what I have read and what I really know.

Q.—From the Home Treatment Book that is prepared by Mr. Wheatley? *A.*—Yes, sir.

Q.—Who is the advertising counsel? *A.*—Yes, sir.

Q.—That is his title? *A.*—Yes, sir.

Q.—You, yourself, would have no knowledge, you said, as to whether certain symptoms which might be stated in those blanks would indicate that a woman had a prolapsus, or dysmenorrhea, or menorrhagia or something else? *A.*—No, sir.

Q.—Miss Gilbert, do you have at the office out there, certain stereotyped——

After argument as to the admission of this question, Mr. T. J. Scofield continued reading:

Q.—Miss Gilbert, do you have at the office out there, certain stereotyped letters that you send in reply to these symptom blanks? *A.*—We have short forms.

Q.—How many different forms do you have? *A.*—About eighteen.

Q.—About eighteen? How do you determine which particular form to send for a particular set of symptoms? *A.*—When they write a letter describing their symptoms, I apply the forms in my judgment that I think would suit that particular case.

Q.—Have you copies of those different forms with you? *A.*—No, sir.

Q.—Can you get them and will you send them in here? Can you get copies of those forms, Miss Gilbert? *A.*—Yes, sir, I suppose so.

Q.—I would like to have you do that, please, and bring them in.

As an exhibit there was then offered to the jury a letter concerning which the witness stated:

Q.—Look at this paper which I hand you, and state if that is one of the letters that is sent out through your department? *A.*—This goes out in the Home Treatment Book.

The letter follows:

CHATTANOOGA, TENNESSEE.

Dear Friend:

As per your request, we hand you herewith a copy of our book "HOME TREATMENT OF FEMALE DISEASES." It contains much valuable information, and we trust it will convince you that CARDUI, the woman's tonic, is a medicine of merit in the treatment of diseases peculiar to women, as well as a strengthening woman's tonic.

It would be well for you to use THEDFORD'S BLACK-DRAUGHT, the old, reliable, vegetable liver medicine, in connection with CARDUI, to regulate the stomach, liver and bowels, as it assists the action of Cardui.

CARDOSEPTIC, (Tablets) dissolved in warm water makes a pleasant, soothing, healing, douche or injection for local female troubles.

These medicines have had wonderful success, for many years, in the treatment of the diseases for which they are recommended, and we urge you to give them a fair trial for your case.

In using them, you will find it of advantage to follow the suggestions in the book about baths, injections, diet, exercise, etc., as this will greatly assist in the treatment. If you need special advice on how to use the Cardui Home Treatment in your case, write us a letter, describing all your symptoms and troubles, and we will reply in a plain sealed envelope.

CARDUI, the woman's tonic, THEDFORD'S BLACK-DRAUGHT, for the liver, and CARDOSEPTIC, Tablets, are for sale at all drug stores, but if you have trouble in getting them we will gladly forward them to you prepaid, upon receipt of price.

Trusting to hear from you further, we are

Very truly yours,
Ladies' Advisory Department,
CHATTANOOGA MEDICINE CO.

SOME FORM LETTERS

Mr. T. J. Scofield then read in evidence the form letters, eighteen in all, which are used by the Chattanooga Medicine Company, which were exhibits in the trial at Chattanooga, a few of which follow:

CHATTANOOGA, TENNESSEE.

Dear Friend:

We have noted your symptoms as you describe them, and suggest that you begin to use CARDUI, the woman's tonic, THEDFORD'S BLACK-DRAUGHT, the vegetable liver medicine, which acts upon the liver and other digestive organs, and CARDOSEPTIC, the antiseptic douche for any local troubles from which you may be suffering.

These well-known medicines, forming the complete Cardui Home Treatment, have proven themselves of great value in correcting female troubles due to menstrual derangements such as periodical headache, backache, pain in the side, bearing-down pains, dragging sensations, dizziness, faintness, leucorrhea (Whites), as well as such signs of liver trouble as sick headache, biliousness, constipation, indigestion, etc., full directions in each package.

We have mailed you a copy of our 64-page book, "Home Treatment of Female Diseases," in which you will find much information in regard to baths, diet, sleep, exercise and vaginal injections, or douches, etc.

You can get all the medicines for the CARDUI HOME TREATMENT at any reliable druggist, but if you have any trouble in getting them, send us the money, and we will forward any of the medicines you want, direct, charges prepaid.

If you need further information, or if the book does not arrive in ten days, write us again.

We hope you will be benefited by these suggestions.

Very truly your friends,

Please note that this letter is not written by a physician, but is the embodiment of what we have learned, through many years of experience, that our medicines have done for others, who suffered in the way you describe.

CHATTANOOGA, TENN.

Dear Friend:

We have your request for additional advice and would say that from the symptoms you describe, a longer course of treatment will probably be necessary, before you can be materially benefited.

From our experience, with cases similar to yours, we suggest that you persistently continue the use of CARDUI, THEDFORD'S BLACK-DRAUGHT and CARDOSEPTIC (Douche), until more permanent results have been obtained.

We mail you another copy of our book, "Home Treatment of Female Diseases," as we think possibly you did not thoroughly read the first copy we sent you, or perhaps did not receive it. At any rate, we strongly urge you to study the book and believe that if you will follow the hints it gives on diet, exercise, baths, and vaginal injections, you will receive marked benefit.

Remember, that our medicines are for sale at all reliable druggists, but if you cannot get them, we will gladly fill your orders direct, charges prepaid, upon receipt of price.

Hoping soon to receive a favorable report of your condition, we are,

Very truly your friends,

Please note that this letter is not written by a physician, but is the embodiment of what we have learned, through many years of experience, that our medicines have done for other ladies, who have suffered in the way you describe.

CHATTANOOGA, TENN.

Dear Friend:

We have noted the symptoms you describe and in reply would say, that although some cases of barrenness are due to stunted or imperfectly developed organs, in your case, from your symptoms, we think there is reason for hope that it may be due to some local weakness or disorder, which, in other similar cases, the CARDUI HOME TREATMENT has been found to relieve.

We suggest, therefore, that you give this treatment a thorough trial, by continuing the use of CARDUI, the Woman's Tonic, three times a day, taking a dose of THEDFORD'S BLACK-DRAUGHT at bed time, as often as may be necessary to keep the bowels regular.

Our 64-page book "HOME TREATMENT OF FEMALE DISEASES," (of which we have mailed you a copy) will give you much other valuable information (see Chapter IV on

Sterility) and we trust you will read it carefully and follow its advice on baths, meals, exercise, etc.

If you need further advice write us freely.

Very truly your friends,

Please note that this letter is not written by a physician, but is the embodiment of what we have learned, through many years of experience, that our medicines have done for other ladies, who have suffered in the way you describe.

CHATTANOOGA, TENN.

Dear Friend:

Replying to your inquiry, we would say that we have received many letters from ladies who have used Cardui, the woman's tonic, and Thedford's Black-Draught during pregnancy, with good results.

These medicines have been found to help strengthen the womanly system, tone up the organs and assist in making childbirth easier. Many ladies who have suffered with miscarriages have found that after taking Cardui during pregnancy, they have become mothers of healthy children.

Others have written to tell how, during this trying time, they have been relieved of headache, backache, sideache, bearing down pains, inability to walk, morning sickness, whites, nervousness, sleeplessness, irritability of temper, and tired feeling, but the use of this well-known woman's medicine and tonic.

We have mailed you a copy of our book, "Home Treatment of Female Diseases" (See chapter Pregnancy.) In it you will find such valuable information about the care of your health, diet, exercise, and the use of vaginal injections, all of which we suggest it will pay you to study and follow.

We trust that this letter will help you and that you will use the Cardui Home Treatment with benefit to yourself and the expected child.

Very truly your friends,

Please note that this letter is not written by a physician, but is the embodiment of what we have learned, through many years of experience, that our medicines have done for other ladies, who have suffered in the way you describe.

CHATTANOOGA, TENN.

Dear Friend:

We have noted your favor of recent date and will say that for misplaced or falling womb and, possibly, affected ovaries, many reports have been made to us regarding the efficacy of CARDUI, and we suggest that you take Cardui, three times a day, increasing to four times a day shortly before, and during, menstruation. As in the conditions you describe the liver and digestive organs are more or less deranged, we think you will find BLACK-DRAUGHT of great aid to the treatment, as it acts on the liver and stomach, and regulates the bowels and digestive functions.

CARDOSEPTIC has been found to relieve itching, irritation, inflammation, and unnatural discharge, when used regularly, as a vaginal injection or douche.

We have mailed you a copy of our 64-page book, "Home Treatment of Female Diseases," in which you will find very full information about cases similar to yours. (See chapter on Displacement). The book will tell you how important it is that you should do no hard or straining work, such as lifting, sweeping, running a sewing machine, or even walking up and down stairs, or standing too long on your feet.

It also tells how beneficial it will be to rest in bed a portion of every day, describes a simple home method of womb replacement recommended by Dr. Thomas, (See page 51), and gives many valuable hints on diet, baths, exercise, etc.

Trusting that these suggestions will help you, we are

Very truly yours,

Mr. T. J. Scofield:—With the same note at the bottom, stating that it was not written by a physician.

CHATTANOOGA, TENN.

Dear Friend:

We are in receipt of your request for advice, but have no special medicine for the case described by you, and advise that you consult a good physician.

Whenever there is present constipation, biliousness, or stomach trouble, we think you will find Thedford's Black-Draught liver medicine of great benefit. Acting as it does on the organs of digestion and elimination, it tends to help the system to respond to any treatment that may be required.

Black-Draught is for sale at all druggists, and we trust that you will give it a trial.

Yours very truly,

Mr. T. J. Scofield:—With the same afternote to the effect that this letter was not dictated by a physician.

TESTIMONY OF DR. WEBSTER

DR. RALPH W. WEBSTER, called as a witness for and on behalf of the defendants, having been first duly sworn, testified as follows:

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Mr. T. J. Scofield:—If the Court please, Dr. Webster is a chemist whom we call to testify to facts.

Q.—What is your name, so that the reporter may get it? *A.*—Ralph W. Webster.

Q.—Where do you reside, Mr. Webster? *A.*—4644 Lake Park Avenue, Chicago.

Q.—Chicago, Illinois? *A.*—Yes, sir.

Q.—What business are you engaged in, if any? *A.*—I am a chemist and clinical pathologist.

Q.—Are you connected with any institution in this city, in connection with your work? *A.*—Yes; I have a laboratory of my own, called the Chicago Laboratory, and I am teaching in Rush Medical College.

Q.—Rush Medical College of this city? *A.*—Yes, sir.

Q.—As the Medical Department of the University of Chicago? *A.*—Yes, sir.

Q.—How long have you been engaged in that work? *A.*—Practically ever since 1898, when I graduated from Rush Medical College.

Q.—Have you continuously pursued the study of chemistry and such matters as come within your specialty since then? *A.*—Yes, sir, I graduated from Rush Medical College in 1898, and from then until 1901 I was at the University of Chicago in the Physiological Chemistry Department, and took a Doctor of Philosophy degree from the University of Chicago in 1901; and was there till 1903, when I went abroad for a year or more to study various branches of medicine and chemistry.

Q.—And then, on your return to this city, you still continued along the line of your special work? *A.*—Yes. Since 1904 I have been engaged in that work, in Chicago.

Q.—Doctor, will you tell the jury whether or not from the experience—from your study, and from the experience which you have had, you are able to make analyses of drugs or medicines, which may be submitted to you for that purpose? *A.*—I have examined a great many of them.

Q.—Do you know anything about a preparation—have you ever seen a preparation that is called Wine of Cardui, manufactured by Chattanooga Medicine Company? *A.*—I have.

Q.—Have you ever made an analysis of Wine of Cardui? *A.*—I have made several.

Q.—Where did you get the samples which you analyzed? *A.*—The first samples I obtained from Mr. Warren through Dr. Cramp, in the laboratory of the AMERICAN MEDICAL ASSOCIATION on Dearborn street. I later obtained some further samples from Mr. Leech in the laboratory of the AMERICAN MEDICAL ASSOCIATION; and I also independently purchased one bottle of Wine of Cardui in the open market.

Q.—In the City of Chicago? *A.*—Yes.

AN ANALYSIS OF WINE OF CARDUI

Q.—Now, will you tell us—taking the first sample of Wine of Cardui which you analyzed—will you give us a history of that analysis? *A.*—In the first place, I examined it with reference to its general physical appearance, noting that it was a dark brown liquid, of a rather marked peculiar odor, resembling valerian; had a bitter taste. I then determined the amount of alcohol present in the preparation, and found approximately twenty per cent. of alcohol, by volume. The total solids in the first preparation which I examined were about three per cent.—the exact figures are 3.52, I believe—three decimal fifty-two. Other specimens which I examined show figures varying from this in silght degrees, but only very slight. I then made examinations for the presence of various groups of drugs, and found no alkaloids present. By alkaloids I mean such substances as quinin, strychnin, atropin, conin, aconitin—and the more common drugs that are used for medicinal purposes—that is many of the most common drugs.

I made special examinations for drugs which contain a certain—which are used as cathartics, drugs such as senna, aloes, cascara, rhubarb, etc., and found no trace of drugs of this type present.

I also found there were no iodids, no bromids, no arsenic, no antimony, no drugs of any type of the more usually known emetic drugs, which include apomorphin, ipecac, antimony, etc.

I then examined for the presence of carduus benedictus. While there is no—to my knowledge, there is no especial test for the actual presence of carduus benedictus, there is presumptive evidence of its presence in the fact that nitrates were found, and also in the fact that I was able to obtain a small amount of non-crystalline yellowish bitter residue, which has been given by various authors the name of cnicin, which indicates its derivation from cnicus benedictus, or carduus benedictus.

I then examined for the presence of all—or then tested for the presence of viburnum. Viburnum is a drug which can be determined definitely in no way with which I am familiar.

Viburnum has a strong valerian-like odor, which was present in this preparation of Wine of Cardui, and is, therefore, presumptive evidence of the presence of viburnum. The only other way by which viburnum could be identified would be by the detection of a specific resin known as viburnin, which has no specific reactions, as far as I am aware.

The analysis as made by me shows—or showed that Wine of Cardui was a twenty per cent. alcoholic extract of carduus benedictus and viburnum, containing no potent drugs—no emetic drugs, no carthartic drugs—

Mr. Hough:—One minute. I understand he is not testifying as an expert. If he gives that opinion, he is qualifying as an expert——

THE COURT:—No. We don't want your opinion, Doctor; we want your statement, as a matter of fact, what you found.

The Witness:—I am stating that, Your Honor, as a matter of fact.

THE COURT:—That is the way I understand it; just so there is no dispute about it.

The Witness:—That is not based on my opinion.

Mr. Hough:—If the Court please, may I have that read.

THE COURT:—The witness said it was not based on his opinion at all. This is what he found.

Mr. Walker:—Well, the last answer indicated his opinion, I think, that is, the last part of his answer.

THE COURT:—I think the jury has disabused themselves of that proposition, because the witness says that this what he is telling us he found, as a matter of fact.

Mr. Hough:—Now, may we have the last question and answer read?

Mr. Walker:—Just the last part of the answer.

> "The analysis as made by me shows—or showed that Wine of Cardui was a twenty per cent. alcoholic extract of carduus benedictus and viburnum, containing no potent drugs, no emetic drugs, no cathartic drugs,—"

THE COURT:—You may go on, Doctor.

The Witness:—No—the words "potent drug" would rule out of consideration a very large number of drugs which I need not take the time to name, other than the fact that there were no drugs found which would be considered—or which were potent, powerful drugs.

THE COURT:—Now, Doctor, will you be good enough to define, for the benefit of the jury and the court, what you mean by potent drug.

The Witness:—I was just reaching that, Your Honor.

THE COURT:—Yes.

The Witness:—By a potent drug I mean a drug which has visible physiological effects noted after the taking of a reasonable amount of a drug. In other words actions which could be noted, actions which could be observed after the drug was taken. In order to show this point, several examinations were made upon myself, as regards this point.

If any emetic drugs were present, it can be demonstrated by the taking of the preparation. In order to show whether or not any emetic drugs were present, I took, at two successive intervals in a period of a half day, an entire bottle of Wine of Cardui; one-half bottle at each dose. The effects—after the taking of this half bottle were controlled later by the taking of exactly the same amount of alcohol in water, at a different period. The effects which I observed upon myself were absolutely the effects of alcohol, and nothing else. There was no emetic effect, no cathartic effect and no visible effect other than the effect that you would notice after taking alcohol.

To rule out the effect of alcohol in the Wine of Cardui, I evaporated the alcohol off of an entire bottle of Wine of Cardui, and took the residue which remained, diluted it a trifle with water, and swallowed that in two different sittings.

THE COURT:—I assume that was on a different day, Doctor.

The Witness:—Yes, sir; yes, it was. This produced absolutely no results. The taste was slightly mawkish—the taste might be described as bitter—mawkish taste. To me there was absolutely no sensation of nausea—no sensation of anything beyond the bitter taste, and the increase of saliva which goes with swallowing a bitter material; and the conclusion, or the result of the experiment was that there could have been no emetic, no cathartic principles present in this preparation; otherwise, I would have noted the result.

THE COURT:—That is eliminating, of course, any idiosyncrasies that your system may have to that particular drug.

The Witness:—Yes, Sir.

Mr. T. J. Scofield: *Q.*—Now, Doctor, as I understand you, you made several analyses? *A.*—I made analyses of six different specimens.

Q.—Was there any essential difference in the analyses which you made of these half dozen different samples of Wine of Cardui? *A.*—No essential differences. There were slight variations in the amount of solid residue and in the amount of ash and certain other constituents, but these variations were inconsequential and could be disregarded. The amounts were small and of no moment whatever.

Q.—Now, doctor, can you tell the jury whether or not there was any wine present in Wine of Cardui?

Mr. Hough:—That is objected to as immaterial.

THE COURT:—He may answer:

To which ruling of the Court the plaintiffs, etc., excepted.

A.—I should say there was no trace of wine at all.

Mr. T. J. Scofield: *Q.*—No trace of wine at all? *A.*—No.

THE COURT: *Q.*—Now, Doctor, in that connection, will you define for the Jury and the Court what you mean by wine.

A.—There are two ways of looking at a wine, two definitions and I give the general definition first, which is; that a wine is the product of the normal fermentation of grape juice and contains seven per cent. of alcohol, not less than seven per cent. and not more than sixteen, according to the standards of the United States Government. From the standpoint of medicinal properties, however, this definition is not binding. A wine, from a medicinal standpoint, is a preparation in which the medicinal properties of a drug have been extracted by wine; and by "wine" I mean the wine which I have previously defined legally, or according to the standards of the United States Government.

THE COURT: *Q.*—Do you confine wine to grapes entirely? How would you define currant wine? I have heard of such a thing.

A.—A wine, legally speaking, is a fermented product or the product of fermentation.

THE COURT:—Not "legally speaking"; we are supposed to know what that is; but what do you mean by "wine"?

A.—By "wine" medically speaking, I mean the fermented juice of the grape. Currant wine, raspberry shrub and various other preparations are, medicinally speaking, not wines in the strict sense though they are a fermented product.

Mr. T. J. Scofield: *Q.*—Now, doctor, fruit wines, are they from the natural fruit fermented or not? *A.*—Fruit wines should be made from the special fruit, the name of which the wine bears.

Q.—Doctor, is alcohol necessary for solution of the principles contained in Wine of Cardui?

Mr. Hough:—That is objected to. That is an expert question.

THE COURT:—He may answer. As you found it.

To which ruling of the court the plaintiffs and each of them, by their counsel, then and there duly excepted.

A.—I evaporated the alcohol and water from the Wine of Cardui and found a certain definite residue in each case. This residue, on treatment with water, dissolved practically completely with only the faintest trace of residue remaining, showing that alcohol was absolutely unnecessary for solution of the active ingredients present in this preparation.

Mr. T. J. Scofield:—That is all, Doctor.

CROSS-EXAMINATION BY MR. HOUGH

Q.—Doctor, when did you make these different analyses? *A.*—At various times during the last year. I cannot give the exact periods.

Q.—When did you make the first one? *A.*—If I remember correctly, I received my first specimens from Mr. Warren in February last year, and I made my first examinations soon thereafter.

Q.—Do you mean February, 1915? *A.*—Yes.

Q.—Who is Mr. Warren? *A.*—Mr. Warren is one of the chemists in the laboratory of the AMERICAN MEDICAL ASSOCIATION.

Q.—You do work for them regularly? *A.*—I cannot say that I have. I have not done work for them previously.

Q.—When did you make your second test? *A.*—I cannot tell you the exact date. Those analyses ran over the period from February until within the last month.

WITNESS' SENSATIONS ON DRINKING WINE OF CARDUI

Dr. Webster then testified as to the dates of various analyses, where he secured samples, etc. He was then asked:

THE COURT: *Q.*—Doctor, were those samples all sealed, I mean in their original condition?

A.—Yes, sir; those were in the original carton.

Q.—And bore the same label?

A.—Bore the same label, yes.

Mr. Hough: *Q.*—And you opened them yourself? *A.*—I opened them myself.

Q.—How many times did you drink some of this sample that you obtained, which I have referred to as the third sample, to test whether it had any emetic principle? *A.*—I tested one bottle as I said on my direct examination, by dividing it into two portions, taking half of it say in the morning—I cannot remember the exact hour—and the other half in the afternoon of the same day, or within two or three hours of the time I took the first half. That was one bottle.

Q.—Were you told that they wanted to prove that it was not emetic, you knew that, didn't you when you made the test? *A.*—I cannot recall that I was told that definitely; but one of the ways in which one would make a decision for himself, as to whether his chemical results were exact would be to take some of the preparation and find out.

THE COURT: *Q.*—Before you took that, you had satisfied yourself that there was no substance in it that was poisonous I presume?

A.—I had, absolutely, or I should not have taken half a bottle of it.

Mr. Hough: *Q.*—When you said you did not find any potent substance in there, you meant poisonous substance, did you not? *A.*—No, I mean any strongly acting substance; not necessarily poisonous.

Q.—Well, how can you say what is an acting substance, as a chemist making an analysis? *A.*—I have read indirectly about the action of drugs and have heard others speak of them.

Q.—You have not qualified as a therapeutist, have you? *A.*—Do you mean at the present time?

Q.—Yes, you did not—

THE COURT: *Q.*—In this particular instance, Doctor, you took a chance.

A.—I took a fighting chance, yes, sir.

Mr. Hough: *Q.*—That is, with reference to whether it was an emetic or not, but not with reference to whether he could say that it had no therapeutic value. That is what I understand he is trying to say. *A.*—I think I said on my direct examination that at the present time, I am Professor of Pharmacology and Therapeutics in Rush Medical College.

Q.—Then you recognize in making that statement, you were testifying as an expert? *A.*—Not at all. I am simply stating as a fact, that there were no emetic principles present, from the results upon myself. I know—

Q.—I am not talking about the emetic principle. You said that there was no potency in any of the drugs. Isn't the statement from a therapeutist, that there is no potency in a drug, an expert opinion? *A.*—I think not.

THE COURT:—I asked Dr. Webster to state to the Jury what he meant by "potency" and he told us. Now, if on cross examination you ask of this witness for matters of opinion, that does not make him an opinion witness on the part of the defendants here. I want that statement made clear in the record and I want to have it understood.

Mr. Hough:—I don't mean to qualify him as an expert.

THE COURT:—What I mean to say is that you cannot make him an opinion witness by cross examining him. He defined what "potency" meant as he used it in his direct examination; so, when he uses "potency" in his cross examination, it means the same thing.

Mr. Hough:—If I understand the witness correctly then, that don't mean that there is no therapeutic value in the drugs which he found in the medicine.

The Court:—He did not so testify as I understood him.

Mr. Hough:—With that understanding, I will go no further on that point. I got the contrary impression.

The Court:—You may ask him, however, if you choose—

Mr. Hough:—I have no desire to make him an expert.

Q.—When you tested this, you were told that it contained carduus benedictus, were you? *A.*—I am not—I would not say definitely to that, that I was told. I had seen the article.

Q.—You had seen the article and that it stated that it did contain it.

A.—I had seen a statement in The Journal of the American Medical Association, but I was not told anything. I was given the preparation and asked to see what was there.

The Court: *Q.*—Was there anything on the label, doctor, as to what was there?

A.—Yes, 20 per cent. alcohol.

Q.—And nothing more?

A.—No, that is the statement of all that there was in it.

Mr. Hough:—You had seen the statement also in the article that it was not an emetic? *A.*—I had seen the explanation, yes.

Q.—When anyone wants an unbiased report from a chemist, they never tell them, or let them know what is in the substance that they are to analyze, do they? *A.*—Very frequently they do, yes.

Q.—Not when they want an unbiased opinion, do they? *A.*—A chemist's opinion is always unbiased, sir.

The Court: *Q.*—In other words, you regard your science as an exact science.

A.—Quite exact, sir.

Mr. Hough:—Well, now then I suppose you know when you were analyzing for carduus benedictus that carduus benedictus contained a volatile principle, didn't you? *A.*—It is reported to have, yes.

Q.—Don't you know it? *A.*—Well, I won't say that I did not know it, and I won't say that I did know it. In reading what is supposed to be the principles in carduus benedictus, there is a volatile principle mentioned.

Q.—There are resins there? *A.*—Yes.

Q.—Now, when you evaporated it to dryness, you drove off all the volatile principles, didn't you? *A.*—If there were any there, I did.

The Court: *Q.*—Let the court interrupt once more. What do you mean by "resins?" I think the Jury and the Judge know just one kind of resin or "rosin" as we term it. What does the term comprehend?

A.—Resins are uncrystallizable materials which are obtained from drugs, residues obtained from drugs which are insoluble in water; soluble in alcohol and ether and ordinarly have no definite, known chemical composition and very few, if any of them, have definite chemical reactions by which they can be absolutely identified.

Mr. Hough: *Q.*—Resin bearing drugs are potent, are they not? *A.*—Yes, a great many of the resin bearing drugs are cathartic drugs.

Q.—You would call that potent, wouldn't you? *A.*—Yes, sir.

Q.—Is it not a well known fact among chemists that there are many vegetable compounds which cannot be accurately analyzed for the purpose of telling the ingredients? *A.*—Chemically speaking, yes.

Q.—Do you wish to go on record as stating that, without having read what was in The Journal, you could have determined that this contained viburnum prunifolium and carduus benedictus from the analysis alone? *A.*—Well, as I stated on my direct examination, Mr. Hough, that carduus benedictus was identified indirectly by the presence of a hypothetical substance known as cnicin which is an amorphous, yellowish, bitter material, which does not identify it absolutely—or in my case, did not identify it absolutely as cnicin, because I was not able to obtain enough of it to make a definite chemical examination as to carbon, hydrogen, oxygen and so forth, to make its molecular formula; and in the case of viburnum, I was identifying viburnum by the odor, the valerian-like odor which is somewhat characteristic, although not absolutely characteristic of viburnum.

Q.—Then you would say that from your analysis you could not say definitely that—what was in this compound? *A.*—I would not want to say that I could swear absolutely that carduus benedictus and viburnum prunifolium were present from these two points, as regards the chemical proposition.

Q.—And if the thought had not been put in your mind by the article, or what was told you, you would not have thought of either one of those, would you, except as a possibility, I mean, you could not have stated what they were?

The Court:—Why not include the label with the article? The label as I understand it, is "Wine of Cardui."

Mr. Hough:—But not intended to be descriptive. I mean, anything that might suggest something.

The Court:—That might be just a plain trade name.

Mr. Walker:—A trade name. The question is whether taking the stuff itself without the suggestion of those two names, he could have ever said that they were there?

The Court:—That is the question.

The Witness: *A.*—From my direct chemical examination, probably I would say that I could not have identified it absolutely as carduus benedictus. The viburnum was strongly presumptive, the odor was strongly presumptive of viburnum; knowing in a general way what this preparation was used for, knowing the name of the preparation, I might have stated that carduus benedictus and viburnum were present, from this combination of circumstances, had I not seen the article.

Mr. Hough: *Q.*—But if you had not seen the article and had not seen the name on the label, but had just been given the substance with no suggestion, then you could not have told, could you?

A.—There are certain drugs that cannot absolutely be detected chemically, and I would say that from the chemical examination alone, without outside inferences, that probably a definite statement could not have been made.

The Court:—By the process of exclusion what drug could this peculiar odor that you got refer to save viburnum?

A.—Valerian possibly and valerianic acid; cnicus benedictus or cnicin; it could have been obtained from very few other drugs, had I been able to get enough cnicin to identify it absolutely, so that the composition could have been limited rather closely, had nothing ever been published or said or known about the proposition.

Mr. Hough:—You mean you may have been able to say that it was one of three or four different things? *A.*—We might have gotten it down that close, yes, and by exclusion of other things and so on, you could have come closer than that perhaps.

Q.—How do you know you got any cnicin? *A.*—As I said, I cannot absolutely swear that I had cnicin. Cnicin is a compound which is obtained, according to the literature (and we have to go to the literature to obtain facts) cnicin is obtained from carduus benedictus by a certain process. This process was followed out to a certain extent in these examinations and the yellowish amorphous bitter substance, obtained.

Q.—Just state the process you went through in order to determine cnicin? *A.*—It was a pretty crude proposition in order to give the benefit of the doubt to the presence of cnicin, and it consisted in evaporating the alcohol from the preparation, shaking out with ether and evaporating the ether solution and weighing the residue, which was a yellow amorphus, bitter material. Under these conditions, cnicin is left, although cnicin in the absolutely pure state, is stated to be soluble in ether, it is soluble in ether under the conditions of the experiment, the acidity of the solution and the presence of other material, and is extracted in the official process by ether.

Q.—When you say "official process" what do you mean? *A.*—I mean the process first devised, according to the literature, by Swantner, Schreiver, Nativelle and others.

Q.—When was that? *A.*—Around 1840 I judge, or 1836.

Q.—Has any additional experimental work been done on that since 1846? *A.*—Well, I could not say. There has been a considerable amount of work done by the American Medical Association in the last year.

Q.—On carduus benedictus? *A.*—On a study of the Wine of Cardui which contains carduus benedictus.

Q.—I am talking about carduus benedictus. *A.*—Yes, there has been a study of carduus benedictus made.

Q.—By whom. *A.*—I cannot recall now. By several of the men.

Q.—Where was it published. *A.*—As far as I know, it has not been published.

Q.—I am asking if there has anything been published on the subject. *A.*—I beg your pardon. I did not know that you asked if it were published. As far as I know, there has no work been done on carduus benedictus on account of the fact that it was supposed, according to the work that had been done from 1840 on, to be a worthless drug, and there was no use in making any examination.

Q.—What standard book said that carduus benedictus was a worthless product? *A.*—What standard book?

Q.—Yes. Is the United States Dispensatory standard? *A.*—No, not at all.

Q.—Is that any authority? *A.*—No.

Q.—Then you would not believe anything that was in the United States Dispensatory? *A.*—I would believe a few things, but there are many, many things that I would not believe under any conditions.

Q.—What other book did you read about carduus benedictus in? *A.*—No book that I know of.

Q.—Did you read Dr. Hare's book on this subject. *A.*—No, I never read Dr. Hare's book on the subject, and I don't believe he has one.

Q.—You don't believe he has one? *A.*—Not on carduus benedictus.

Q.—Did you ever read the Dispensatory by Rusby, Hare and Casparia? *A.*—Yes, I have heard of that Dispensatory, but I do not consider it standard.

Q.—You know Dr. Hare wrote that, don't you? *A.*—Not all of it I do not think, by any means.

Q.—Of course, it was written by the three of them, they collaborated, but you know that he wrote that article on carduus benedictus? *A.*—I do not know. The United States and National Dispensatories are merely books of reference that have no standing whatever; they are not books that are recognized as standard. They are simply a compilation of facts taken from the literature and the men who have written on the various subjects and they mean nothing to one who goes to the original literature.

Q.—What is the original literature of carduus benedictus? *A.*—The works of Schreiver, Swantner and Nativelle.

Q.—Did you ever read Lobach? *A.*—No, I never heard of Lobach's work on carduus benedictus.

Q.—Did you ever hear of Lobach at all? *A.*—I have a hazy opinion that I have, but I don't know in connection with what.

Q.—Have you ever heard of Radamacher? *A.*—Yes, sir.

Q.—Did you ever read what he said about it? *A.*—Not on carduus benedictus.

Q.—Do you know what he said about it? *A.*—I do not.

Q.—If it was in the pharmacopeia, would it be considered a potent drug?

Mr. T. J. Scofield:—That is objected to as not cross examination. I have not heretofore interposed any objection, but I do not know what this is cross examination of.

THE COURT:—The witness has not qualified as an expert.

Mr. Hough:—No, but he has qualified on carduus benedictus far enough to justify him, in his own opinion in stating that it was regarded as worthless.

THE COURT:—Well, if you wish to go ahead on that line, I will overrule the objection.

Mr. Walker:—He interjected that himself.

THE COURT:—Go ahead. What this opens up on redirect I won't undertake to say.

To which ruling of the Court the defendants and each of them, by their counsel, then and there duly excepted.

Mr. Walker:—Well, will your Honor strike out all this witness's evidence on that subject?

THE COURT:—No.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough: Q.—You say the United States Dispensatory and Dr. Hare's National Dispensatory are not credible books. A.—No, I did not say that, Mr. Hough. I said they were not recognized as standard authoritative works. They have no legal standing; they are not recognized as standard works. Many of the statements in both of these books are true and many of them are wrong and fallacious and therefore not reliable.

Q.—How do you reach the conclusion that they are wrong? A.—Because I know personally, regarding many of the statements that I have in mind as being wrong.

Q.—What personally do you know in regard to their statements being wrong in reference to carduus benedictus? A.—I do not know only the fact that any statement made in this Dispensatory, any statements regarding carduus benedictus are simply statements which are taken from the previous literature. They are compilations of material which has been published and has nothing to do with Dr. Hare, Caspari, etc.

Q.—You say the original publications in reference to carduus benedictus—the original contention was that carduus benedictus was no account? A.—I said in reference to publications with which I was familiar.

Q.—Then they must have been familiar with some publications which you did not know anything about, if they give a different statement. A.—The United States Dispensatory does mention the work of Schreiver and Swantner, as I remember and refers to the articles of these men and the work of Nativelle also in which it was supposed that certain effects were ascribed to carduus benedictus by these men. That does not say in the United States Dispensatory, as I recall the article, that carduus benedictus has certain effects, but the Dispensatory says that Swantner and Schreiver and Rademacher, if you will say that it has certain effects. They ascribe certain results to it, which is of no more value (so far as my personal opinion goes) with my experience than it would be if they had said it had no effect.

Q.—They must have thought it had such an effect, or they would not have reported it and put it in?

Mr. T. J. Scofield:—That is objected to.

THE COURT:—The objection is sustained. We can assume that they thought it had such an effect.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough: Q.—Am I correct in saying that you state that in your opinion, it is worthless? A.—I have no opinion about it. I am stating as a fact that it contains no potent drugs, no emetics, no cathartics. I did not try to express any opinion regarding whether it was worthless or not.

Q.—You are talking now about Wine of Cardui, are you not? A.—Yes.

Q.—I am asking you about carduus benedictus. A.—I am not qualified as an expert.

Q.—You say that carduus benedictus has no value therapeutically? A.—If you ask me directly, I say, no.

Q.—How do you know? A.—Well, there are many ways in which I may know it; from general discussion.

Q.—You mean you know it because you read it in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION? A.—That might be one way that I would know it.

Q.—Now you said that you tasted it and it was mawkish? A.—Yes, sir.

Q.—Do you mean that? A.—I certainly do. I said it had a mawkish taste when the alcohol was taken off.

Q.—Mawkish means nauseous, don't it? A.—No.

Q.—What dictionary do you find that says that it don't mean nauseous? A.—Mawkish is not necessarily nauseous. There is a peculiar fur-raising—a peculiar irritating effect upon the tongue that is described as "mawkish." It is different from a nauseous taste that you get. I cannot give an explanation of the difference, but I have it distinctly in mind. I do know that there was absolutely no difficulty whatever in swallowing half a bottle of the Wine of Cardui, and there was no difficulty whatever in taking the non-alcoholic product, but I would much have preferred if I was asked to take either one, I would have much preferred the alcoholic product because it tastes better than the non-alcoholic.

The further hearing of the cause was then adjourned until the following day, March 29, 1916, at 10:30 o'clock a. m.

March 29, Morning

The Court met pursuant to adjournment at 10:30 a. m., March 29, 1916.

Dr. Ralph W. Webster resumed the stand and cross-examination was continued by Mr. Hough.

FURTHER CROSS-EXAMINATION BY MR. HOUGH

Q.—Doctor, when you stated on your direct examination that you found no potent drug in Wine of Cardui, did you mean to say that neither carduus benedictus nor viburnum prunifolium was possessed of any therapeutic or medicinal value? A.—I was testifying as to a fact, the fact that I found no potent drug and I stated, under the head of potent drugs, that I found no alkaloids,—

Q.—Now won't you please answer the question just as I asked it instead of going off on another matter.

THE COURT:—You may answer it, doctor, by saying whether or not, as you have defined a potent drug, you found any. A.—I did not.

Mr. Hough:—Now will the reporter read my question.

(The pending question of counsel was then reread.)

A.—I am not testifying as a therapeutist.

Q.—But you can say "yes" or "no" to that and then make any explanation you like. Did you mean that or did you not mean that? A.—I meant exactly what I said, that I found no potent drug and I think that explains itself fully, because I explained my definition of "potent drug."

Q.—Did you mean that carduus benedictus and viburnum prunifolium had no therapeutic or medicinal value, by that answer? That is a very simple question to answer "yes" or "no" it seems to me. A.—May I explain my answer, your Honor.

THE COURT:—Yes.

Mr. Hough:—Well I suggest, if the Court please, that I am entitled to have an answer first.

THE COURT:—Yes, you may answer the question.

Mr. Hough:—It can be answered "yes" or "no" and then you can explain it at your leisure.

(The pending question was then read.)

A.—I would say yes. My reason for answering that is simply that assuming that carduus benedictus and viburnum prunifolium theoretically had any therapeutic effects whatever, there was not sufficient material, not sufficient active constituents of those drugs present in Wine of Cardui to produce any therapeutic results, and certainly there was not sufficient of those drugs present to come under my definition or my understanding of potent drugs.

Q.—Then you mean to say that, if there had been more carduus benedictus or viburnum prunifolium in Wine of Cardui than you found, it would have possessed therapeutic value?

Mr. T. J. Scofield:—That is objected to.

Mr. Hough: Q.—Or would have been potent as you have defined the word.

Mr. T. J. Scofield:—That is objected to.

THE COURT:—He may answer.

To which ruling of the court the defendants, etc., excepted.

A.—Regarding carduus benedictus I think I stated that carduus benedictus was a drug possessed of no therapeutic value. Regarding viburnum I would not make the same statement.

Mr. Hough: Q.—Now the question of potency of drugs or of a drug possessing or not possessing therapeutic value from the chemical standpoint, is a therapeutic question. It is not a chemical question, is it? A.—Only in so far as the chemist can determine how much of a potent drug is present. A drug may be potent and there be very little of it present in the preparation and therefore it is not a potent preparation. The drug is potent, but the preparation is not potent.

Q.—The province of chemistry is to determine what is in an ingredient and how much; that is the province of chemistry, is it not? A.—Yes, sir; and in doing that they determine absolutely whether there is potency in the preparation.

Q.—Isn't that second question a therapeutic question? Doctor, would you mind looking at me when you are answering? A.—Not at all.

Q.—Isn't that a therapeutic question? A.—It is a therapeutic question as far as the direct determination of the actual effect goes, yes, sir.

Q.—Now you stated that, according to the work that had been done on carduus benedictus from 1840 on, it was a worthless drug and therefore no examination had been made since? From 1840 to what date did you mean? A.—I said no examination. I had in mind that the literature of recent periods had not discussed carduus benedictus in any way, the literature that I was familiar with. By "recent periods" I mean within the period of my own actual knowledge of drugs.

Q.—Now, Lobach and Rademacher come within that period, don't they? A.—No, Lobach worked in 1859 as I understand it.

Q.—Isn't that after 1840? A.—Yes, but not very much after as compared with 1916.

Q.—What was the date of Rademacher? A.—I could not give you the date of Rademacher; it was somewhere after 1840 I think.

Q.—The *American Journal of Medical Sciences* had an article on the subject in 1859, didn't it? A.—By whom?

Q.—On carduus benedictus. A.—I believe not, I would not say but what I have in mind in that connection is the article of Lobach on carduus marianus which is not carduus benedictus.

Q.—What is the difference between carduus marianus and carduus benedictus? A.—I am not a pharmacist.

Q.—How can you say there is a difference between the two? A.—The difference in the name indicates it.

Q.—Don't they state that they have the same action?

Mr. T. J. Scofield:—Wait a moment, if the Court please—

THE COURT:—The article will show that if you have it.

Mr. Hough:—I have it and I will read it to him and ask him if he disagrees with it.

THE COURT:—Not at this time.

Mr. Hough:—I think where he states that there is no writer who has said anything except that the drug was worthless, between certain periods and I identify a publication as coming between that period, I can read from that publication in order to contradict him.

THE COURT:—Yes, you can offer it in evidence when your turn comes.

Mr. Hough:—My understanding is that it should be done at the time when the witness is on the stand. That is the rule so far as we have used it heretofore.

Mr. Walker:—Has the Court got in mind the language of the answer of the witness that he gave yesterday?

THE COURT:—Perfectly. It has been repeated here today.

Mr. Walker:—It was by Mr. Hough.

Mr. Hough:—Now I ask leave to read this article in the *American Journal of Medical Sciences,* edited by Isaac Hayes, M.D., published quarterly, Philadelphia, London and Paris, 1859, a quarterly summary of the improvements and discoveries in medical science on the action of carduus marianus, carduus benedictus, and odo-pordom and scanthium to contradict the witness.

Mr. T. J. Scofield:—In his direct examination, Dr. Webster did not base any opinion he expressed upon any recognized or standard medical authority or writer on these subjects. I do not understand that on cross-examination they may ask him questions such as they have asked him, and then undertake to introduce an article from somebody on this subject, as contradictory of his testimony.

THE COURT:—The Court is of the opinion that this is not the time to offer that article. You may save your point in the record.

Mr. Hough:—I cannot continue the cross-examination of the witness on that point. I think Judge Scofield will agree with me that, under the rule that we have been offered in evidence, where you establish the right to introduce it at all you read it to the witness for the purpose of contradicting him and then ask him about that article and give him a chance to take back, if he pleases, what he has said.

THE COURT:—Well, perhaps the witness does not care to. The question is whether anything has been written about this subject since 1840. Now, if you on rebuttal, have something which was written since 1840 and the question is material, then is the time to offer it.

Mr. Hough:—I submit that now is the time, your Honor.

THE COURT:—You may save the point.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough: Q.—Did you read what was in that article? Have you ever read what was in that article that I have just called your attention to? A.—By Dr. Lobach?

Q.—No, from the *Journal of Medical Science.* A.—I cannot say that I ever have, because I do not know the author and I am not familiar with the title. I do not think that I have ever read it.

Q.—Have you ever read Nonaugh on the febrifuge property of cnicin? A.—I never have.

Q.—Have you ever read Wegh and Libeg on the bitter principle of carduus benedictus, centaurea benedictus? A.—I never have.

Q.—Centaurea benedictus is the same as carduus benedictus, isn't it? A.—That is the name that is applied to it, yes, sir.

Q.—And cnicus benedictus is the same thing also? A.—Yes, sir.

Q.—Have you ever read Claris, a German work on Materia Medica, in reference to what it says on carduus benedictus? A.—No, sir.

Dr. Webster was then questioned as to his knowledge of numerous literary references to carduus benedictus, including Anthon, a medical dictionary published in Germany; Haugan, on Therapeutics; Buchheim's Materia Medica; United States Dispensatory, 1877; United States Dispensatory, 1883; Thoy; Sohn, an English dictionary of active principles of plants; United States National Dispensatory, 1894; Swantner; Hale's Materia Medica and New Remedies; Green-Lippincott's Medical Dictionary; Scudder's Materia Medica, King's American Dispensary; Gould's Dictionary of Medicine; Ellingwood's Therapeutics; Dinaud on Medicinal Plants, and Potter's Therapeutics.

The Court then said:

THE COURT:—I think I will stop this examination, because this witness was not called to give answers to questions on therapeutics.

Mr. Hough:—I submit, your Honor, that the other side brought it out and that this witness brought it out this morning by the statement that these drugs were not potent, meaning thereby—

THE COURT:—Well, the innuendo is not a part of this testimony and he has explained very carefully what he meant by "potency."

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough: Q.—I will ask the witness this question then, which I asked before, and which was not directly answered: What publications between 1840 and 1910 declared carduus benedictus to be a worthless drug? A.—I cannot state that definitely by giving any direct reference to the literature. My remembrance of all of the literature, at least all of the literature with which I am familiar and a large part of the references about which you have asked me are compilations of the literature of 1840 and from 1840 to 1859; they are dictionaries, encyclopedias, commentaries, etc., which do not in any way give any work done on carduus benedictus. No original work that I know of has been published since 1859. There may be many. I simply say none that I know of, and I do say that those quotations or those publications which you have asked me about subsequent to 1859 and between 1859 and 1905, are simply commentaries, dictionaries and encyclopedias quoting work previously issued and making no statement other than that based simply upon other literature, exactly as chemists take what is included in the Beilstein as a reference book of what has been done in the past. You go to a reference book to find out what has been done. You don't go to a reference book to find out whether it has any value or has not any value. You have got to take that from the experience of the men who are working on the subject and publishing some original observations. That is my reason for making the statement, that, as far as I am aware of, nothing has been published on the subject since 1859. I said yesterday, 1840, but I would like to modify it now and say 1859, because Dr. Lobach worked exclusively as I understand it on carduus benedictus, worked in 1859 on carduus benedictus and that is my position in answering the question.

Q.—When was the work that was done by Nativelle to which you have referred, done? A.—That to my knowledge was not work on therapeutics. The work of Nativelle was published according to my reference in the *Compt. rend. Acad. d. sc.* in 1837, Volume 15, 802.

Q.—Did it not speak of the physiological effects of cnicin? A.—I do not know. The reference I have to Nativelle's work is simply as to the properties of cnicin, its method of preparation, etc., the chemical phases.

Q.—Then you mean to tell the jury that prior to 1859, carduus benedictus was regarded as a valuable drug, but in your opinion has not been proved to be such since then? A.—No, I have not that opinion. I say that prior to 1859 there were occasional references in the literature to carduus benedictus, just as we find references in the literature to other worthless drugs. It does not say—when a man may have an opinion based on certain experiments and certain uses of the drug,—those are sometimes shown to be fallacious by applying modern methhods. What he thought at that time on the question of the actual effect, is his opinion of 1837 or 1840 or 1859. Based on modern ideas and processes, it probably would not come up to the standard of being a valuable drug.

Q.—If you know, when was carduus benedictus first mentioned in medical literature as a valuable drug? A.—I have no idea that it was ever mentioned as such.

Q.—Was it mentioned by Linnaeus? A.—I don't know.

Q.—In what year did Linnaeus live? A.—I have no idea.

Q.—Was it mentioned as early as the sixteenth century? A.—I said I did not know, Mr. Hough.

Q.—You mean that you cannot go back of 1859, so far as your knowledge goes? Is that what you mean? So far as the literature of the subject is concerned, you do not go back of 1859? A.—I have not made any search of the literature, Mr. Hough, simply in connection with my chemical work I have occasion to look up what I could find, roughly speaking, on cnicin. I found references to the work of Schreiver, Swantner and Nativelle and I occasionally looked at the United States Dispensatory of which I spoke a few moments ago, and found certain statements made there. Those are the only statements I have ever seen anywhere or anything written regarding carduus benedictus or cnicin.

Q.—Is cnicin in carduus marianus? A.—Not that I know of. I know nothing about the composition of carduus marianus and I believe now I have never heard it so stated.

Q.—Is cnicin in any other drugs that you know of? A.—I believe not. The name would imply that it came from cnicus benedictus, naturally, simply being the active principle of the drug. I do not state it definitely, however, as not being present elsewhere.

Q.—Is there any cnicin in cnicus arvenicus? A.—I never heard of that drug, I do not know.

Q.—Cnicus erculantas? A.—I never heard of it, I don't know.

Q.—Cnicus canus? A.—I know nothing about it.

Q.—Or cnicus pelustrin? You never heard of any other cnicus containing drugs? A.—I do not know that name. Those are possibly—now I am not sure but what they are possibly synonyms of cnicus benedictus. I do not know whether they are synonyms or names of other drugs. We find half a dozen names sometimes applied to a drug and I am not familiar with the other names in that connection.

WITNESS' VIEW OF WORK OF THE AMERICAN MEDICAL ASSOCIATION

Q.—Are you a member of the AMERICAN MEDICAL ASSOCIATION? *A.*—I am, yes.

Q.—Are you connected with any of the work on THE JOURNAL? *A.*—No.

Q.—What are your relations to those who are connected with THE JOURNAL in the Propaganda Department? *A.*—The same relations that every other member of the AMERICAN MEDICAL ASSOCIATION has.

Q.—Don't you do work for them right along? *A.*—No, not by any means. This is the first time I have ever had occasion to.

Q.—Are you familiar with the purposes of the Propaganda Department? *A.*—I know in a general way what the purposes of the AMERICAN MEDICAL ASSOCIATION are, yes, sir.

Q.—I said Propaganda Department. *A.*—Yes, sir.

Q.—And you knew them before the sample was given to you to analyze, did you? *A.*—Yes, I have been familiar with them for some years.

Q.—And those purposes were to make a general fight on every home made remedy that is not prescribed by a physician's prescription, were they not? *A.*—No, not as I understand it.

Q.—Isn't that what they do as a matter of fact, attack every remedy that is given except those given on a physician's prescription? *A.*—Not by any means.

Q.—Isn't that the purpose? *A.*—No, their purpose is to make an attack on fraudulent preparations. There is a very large difference between fraudulent and nonfraudulent preparations.

Q.—Do you know of a home made remedy that is sold to the public that they don't attack?

THE COURT:—What do you mean by a "home made remedy?" Do you distinguish it from a remedy made by some chemical company?

Mr. Hough:—I mean a remedy made by some chemical house for home consumption without the intervention of a doctor's prescription.

The Witness: *A.*—Well, there is a large number of preparations that have not as yet been attacked and I have no reason to believe that they will be or will not be.

Q.—Have they ever spoken favorably of any remedy that is given to a consumer without the intervention of a doctor's prescription? *A.*—Certainly not, if it is fraudulent.

Q.—Have they in any respect— *A.*—There is no occasion to speak favorably or unfavorably of a preparation if it is all right.

Q.—You know what I mean, Doctor. Will you give me a straight answer. *A.*—I do not understand your question.

Q.—Have they ever spoken of any (whether fraudulent or not) remedy that is manufactured to be sold direct to the consumer, favorably? *A.*—That is not the province of the AMERICAN MEDICAL ASSOCIATION.

Q.—Can't you answer that yes or no? *A.*—I do not know.

Q.—Is it not a fact that there are proprietary remedies that are regarded as ethical by the ASSOCIATION? *A.*—Well, now you are getting on ground, Mr. Hough, that is not comparable to the ground in reference to Wine of Cardui. Proprietary and patent medicines are, to my mind, somewhat distinct. Many proprietary remedies are prescribed by physicians. Many proprietary remedies are recognized and recommended by the AMERICAN MEDICAL ASSOCIATION. Patent medicines of a secret formula and which are advertised directly to the public, and which have no basis, except in fraud, are certainly not prescribed by ethical physicians or by members of the AMERICAN MEDICAL ASSOCIATION.

Q.—But I say there are proprietary remedies which are manufactured for the use of the physician to dispense on prescription, that are not attacked. That is a fact, isn't it? *A.*—These are perfectly ethical propositions. There are.

Q.—Now, the instant that some medicine is advertised to the public, then it becomes unethical and is attacked, isn't that the fact? *A.*—I don't think that is the basis of the attack of the AMERICAN MEDICAL ASSOCIATION. The attack of the AMERICAN MEDICAL ASSOCIATION, as I see it, is on the fraudulent side of the proposition.

Q.—I am asking you if what I said was not a fact? *A.*—I should say not, if I understand your question.

Q.—As an illustration then; as long as listerine was advertised to be sold only to doctors, it was an ethical preparation, was it not? *A.*—I could not answer that. I could answer if I may be allowed to explain, your Honor—

THE COURT:—Go ahead.

The Witness:—exactly what my position is. I do not know personally regarding listerine, but there are many preparations upon the market which have been used which were not attacked by the AMERICAN MEDICAL ASSOCIATION, because their composition was not known; many preparations in common use. There is bromo seltzer, orangine, headache powders of various types which have been used and prescribed by physicians in times past simply because they knew that they produced certain results, as far as the headache went, but they did not know the composition of the drug. As soon as the composition of the drug was shown by an examination made in the laboratories of the AMERICAN MEDICAL ASSOCIATION, and propaganda instituted, physicians learned that those drugs contained remedies which were dangerous when used by the laity. Therefore certain propaganda were inaugurated against headache remedies and cures of that type. Now those remedies contain ethical substances, or substances that are potent and are used and prescribed by physicians. But the physician's attitude is that he does not wish to allow the laity to get these materials into their hands, because they are dangerous to use unless the physician is prescribing them and is on hand to watch the results.

Q.—So you mean to say that they have attacked even bromo seltzer? *A.*—I don't say that they did. I cannot recall whether they attacked bromo seltzer or not. I simply use that as an example of a product that might possibly be attacked as a preparation which contains a dangerous drug and one that perhaps should have been attacked, if it has not. I do not know that it has one way or the other.

Q.—Then the attitude is that anything that is advertised to be used by the individual, without the intervention of a doctor's prescription, is fraudulent.

Mr. T. J. Scofield:—We have not so far interposed an objection, but I object to this.

THE COURT:—I do not think that is a fair summary of the evidence of the witness. Let me see if I got it right: that is, a proprietary medicine contains potent drugs which might become harmful to the laity because they take it without knowledge of what might happen to them then the propaganda of the AMERICAN MEDICAL ASSOCIATION takes it up.

The Witness:—Takes it up and shows to the public and also to the physician the danger of using a drug which they do not know the action of, do not know the possible toxic effects of. It is not a question of whether it is potent or whether it is not potent in that connection. If a drug is potent, it has an action, but the propaganda especially of the AMERICAN MEDICAL ASSOCIATION, as I understand it (and I am not a member of any of the Committees and not associated in any way, but am simply stating my understanding as an outsider) the propaganda of the AMERICAN MEDICAL ASSOCIATION is directed toward the fraudulent patent medicine. Bromo seltzer is a patent medicine (I say that as an example), and may come under the head of a fraudulent patent medicine if it don't contain a potent drug. It claims to do certain things which it can do, but it also is a dangerous drug. Wine of Cardui, to my mind, is a fraudulent preparation because it claims to do things which it cannot do and therefore the propaganda of the AMERICAN MEDICAL ASSOCIATION is directed against preparations similar to Wine of Cardui. That is simply my position. I may be right or wrong.

Mr. Hough:—Of course, that opinion is necessarily an expert opinion. *A.*—Not at all. It is purely an opinion as a physician, and an opinion based upon my direct chemical examination resulting in not finding anything of value in any amount which would produce a result. It is not expert in any sense to my mind.

Q.—Well, that is a question for somebody else to decide. Now, coming back to the original question; the instant the manufacturers of listerine advertised their remedy to the consumer, it was then attacked as fraudulent, was it not? *A.*—I know nothing of the propaganda against listerine. I do not know whether it has ever been attacked or not.

Q.—You are familiar with the literature of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, are you not? *A.*—No, not in detail. I get THE JOURNAL each week, and I run through the articles if there are any there that I care to read, and if there are not, I put THE JOURNAL aside. I by no means read all the propaganda.

Q.—Have you ever seen any statements in THE JOURNAL to the effect that if the business in manufacturing and selling proprietary remedies that go to the consumer, can be wiped out, it will increase every doctor's income on an average of two thousand dollars a year? *A.*—I certainly never have seen any such statement; whether it is there or not I cannot say.

Q.—Have you ever seen anything in the literature along that line, indicating a purpose to destroy the business of self medication? *A.*—I have not. My opinion of the AMERICAN MEDICAL ASSOCIATION is entirely too high to lead me to believe that any such statement has ever been made by the AMERICAN MEDICAL ASSOCIATION.

Q.—And if you were shown that statement in THE JOURNAL, you would not believe it? *A.*—I should have to know how it got in there, and whether I had a certified copy or not.

Q.—Of THE JOURNAL? *A.*—Yes, sir.

Q.—You knew the attitude of the Propaganda Department with reference to this medicine at the time you were making the first investigation, didn't you? *A.*—I did.

Q.—And you had the view about proprietary medicines which you have just indicated, did you? *A.*—Yes, I had the view that fraudulent proprietary patent medicines are as I have expressed myself.

Q.—Now then, in that way, you started to make this investigation with a wholly impartial frame of mind? *A.*—I did absolutely, so far as the chemical examination went. If I should have found something there that was potent, I certainly would not say that it was not there.

Q.—You stated that you found a residuum of three per cent. or approximately that? *A.*—It is varied in different specimens.

Q.—Yet, as a matter of fact the proportion was nearer four per cent. than three, was it not? *A.*—In one specimen it was a trifle over three and a half per cent., and in others it was around 2.9. I never got any higher than 3.52.

Q.—Well, the difference between the two amounts was over 14 per cent., wasn't it? *A.*—It might have been. It varied slightly, yes.

Q.—Is that an immaterial matter in chemistry where there is a variation of 14 per cent.? *A.*—Those variations—when you get down to figures, you can get a variation of 50 per cent. to 75 per cent., and that does not mean much in small quantities such as that where you have already to start with, only three per cent.

Q.—Now, did you make your report as to the first analysis in writing, or by word of mouth. *A.*—To whom?

Q.—To whosoever gave it to you, to make an analysis, the sample? *A.*—The only report that I have ever made has been verbal. As far as I know, no written report did I ever make to anyone on this examination.

Q.—When a sample is given to a chemist to analyze, does he not usually make a written report? *A.*—That is the custom. It depends on the situation and the conditions confronting him in the examination.

Q.—Have you any notes with you of the report that you did make. *A.*—No. I have some notes jotted down, of figures that I found at the time.

Q.—Well, would the oral report that you made differ in any respect whatever from the chemist's report which was printed in the first article April 11, 1914, and repeated in the second article of the JOURNAL of the AMERICAN MEDICAL ASSOCIATION for July 18, 1914? *A.*—I cannot recall the exact wording of the chemist's report. My impression is that the differences, if any, were inconsequential, and that the principal points mentioned in these articles were confirming the figures that I found, were practically the same as those reported. If any variations, they were inconsequential variations in small amounts of the substances which were reported in THE JOURNAL and which I might have varying figures for. But as I explained on my direct examination, these figures were variable figures.

Q.—I call your attention to the chemist's report printed in that article for the purpose of trying to identify and specify your own report. Now, will you state whether in any particular there was a difference between your report and that report; and if there was a difference, indicate it?

Mr. T. J. Scofield:—I suggest that whether or not there is any difference is a question for the jury; they have the chemist's report, and they have his evidence.

THE COURT:—That report is already in evidence.

Mr. Hough:—Yes, but I want his report. I want to get his report or identify it in some way. He said it was not in writing. If he says that is the same as his, all right.

THE COURT:—He has already given his, and the jury has heard it.

Mr. Hough:—It was not a complete report as I understand it.

THE COURT:—However, this answer will probably be of benefit to the jury.

Mr. T. J. Scofield:—Well, we are not objecting to it.

The Witness: A.—It agreed in all essential details with this report. (Referring to the report printed in THE JOURNAL.)

Mr. Hough: Q.—Now then, are you willing to state on your reputation as a chemist, that any chemist from that report alone (without any suggestion from the name itself) could testify as to the drugs from which that medicine was made?

Mr. T. J. Scofield:—That question is objected to. "On his reputation as a chemist"—

THE COURT:—Yes, I think the best way to put the question is to let Dr. Webster do it. He does not know what other chemists could do. Could Dr. Webster do it, that is the question.

Mr. Hough:—There are certain things that are matters of common general knowledge among chemists.

THE COURT:—Then frame your question that way. What you are asking him is as to the state of mind of capacity of some other chemists, and what they could do.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough:—If you had known nothing about the attitude of the AMERICAN MEDICAL ASSOCIATION, and you have no suggestion from the name (which is something that a chemist is not supposed to act upon, as I understand it) could you say from that report what ingredients, what the ingredients were that constituted that medicine.

Mr. T. J. Scofield:—That is objected to. He is putting to the doctor a question as to whether or not a certain thing could be done, under conditions that did not exist. For instance, if there was no suggestion from the name or if he had no knowledge of this proceeding that has been started here, could he then have done this and that?

THE COURT:—I think he may ask the doctor if the solution had been given to him in a bottle without a label on it, whether he would have then dealt with the compound and felt competent to have reached this same result or not.

Mr. Hough:—I don't mean the same result, so far as this report is concerned, but the inference from the report where he says that he had a knowledge of all those other things, which as I understand is not something to be taken into consideration by a chemist. Let me lead up to this in a different way.

HOW THE CHEMIST WORKS

Q.—A chemist, when a sample is submitted for analysis, relies not only upon his methods of determining quantitative results, but qualitative results as well; isn't that so? *A.*—I cannot answer that yes or no without going into an explanation of exactly what the chemist does, Mr. Hough, or what his view is regarding the examination.

Q.—He is also entitled, as a chemical question, to use organic tests, as for instance, taste and sight and smell, in determining what an ingredient is. That is permissible to a chemist, isn't it? *A.*—My answer to your question, Mr. Hough, would necessitate a little explanation, and that explanation is this: no chemist would attempt an examination of a drug or a preparation without finding out all he could about the preparation before he started the examination. If he was given a bottle of medicine, he would ask the person who gave it to him, "For what is it used? What do you think is in there? What is your idea about this medicine? What does it do to you when you take it?" He would get all those facts in the first place. If he did not have some such basis upon which to work, it is probable that he never would be in a position to absolutely determine the composition of a medicine, in months or years.

Q.—Then you mean to say that, if a medicine is given to you and you are told by someone in whom you have confidence, that this medicine is absolutely worthless, you find nothing in it that is of value? *A.*—No, by no means. If somebody tells me that a medicine is worthless and I find it loaded with strychnin, I would not consider it worthless. It makes no difference what a person tells me, but if a person tells me that this medicine is used for rheumatism and they have no idea what is in it, as a chemist I try to find out what drugs might possibly be efficacious in rheumatism, and I think of those drugs and I examine the specimen for the presence of those drugs and if I find them I so state; and if I do not find them, I say that no drugs of that type are present. There may be other drugs there.

Q.—Do you mean to say that what a person tells you about a drug plays some part in the conclusion you reach? *A.*—Not in the conclusion I reach, but in the work which I do. For instance, there are hundreds of drugs in the pharmacopeia and there are hundreds of drugs known—

Q.—You mean that it directs your attention to the particular methods to employ and shortens your labor? *A.*—It shortens my labor and shortens the search for the drug.

Q.—You don't think that so far as you are concerned, anything said about a medicine would affect your conclusion, as to whether it was potent or not? *A.*—Not the conclusion *a priori* on the subject of Wine of Cardui. The question was, what is to be found in Wine of Cardui? And I started out with the proposition of what was to be found in Wine of Cardui, what was present; to find that if I could find it or in any way determine it, to find what was present, or what really was there. I had no desire to find nothing there, and if there had been something there, I certainly should have stated it if I should have found it.

Q.—You read the articles in THE JOURNAL a long time before you did this work, did you not? *A.*—Yes, I read the articles in THE JOURNAL.

Q.—Your mind was made up on the subject, after you read THE JOURNAL, your mind was made up then that Cardui was worthless? *A.*—No. I have had occasion under one or two conditions to be opposed to the findings of the AMERICAN MEDICAL ASSOCIATION, that is, on the examination of drugs. I do not agree with them on all propositions.

Q.—Have you disagreed with them with reference to anything which they have said in the propaganda in these general attacks? *A.*—Not in the general attacks, it is simply a question of some medicines which I have happened to examine, in which varying results have been obtained.

Q.—Wherever there has been an attack on medicine in their written articles, that settled it, so far as you were concerned? You were satisfied that they were right in their conclusions. *A.*—Not absolutely. I know the men who do the work, and I have every confidence that the men who do the work are perfectly competent and perfectly fair in doing it, and I start perhaps with the idea that their work is exact and correct. If I find it not to be, however, I don't hesitate to say so.

Q.—Now then, you say that from that analysis alone, you could say that the drug was made, or the medicine was made from carduus benedictus and viburnum prunifolium. In other words, the analysis excludes any other drug? *A.*—No, I do not make that statement. I never have made that statement from that analysis as you put it to me.

Q.—You said something about the drug not being in a standard work, as I recall, and that the United States Dispensatory was not a standard work. Did you mean that? *A.*—Well, I certainly mean that if you refer to the fact that the United States Dispensatory has anything to do, anything whatever to do with fixing standards. I don't mean that it is not a book that is well known and well used. It is standard in that sense, but from the viewpoint of standard-fixing, having anything to do with saying whether or not it is a standard drug, I say absolutely that the United States Dispensatory or any other dispensatory is not a standard.

Q.—That was not the question that I asked you. I meant whether it was a credible medical work. *A.*—That was not the way in which I answered the question.

Q.—That is the way I meant to ask you. Will you answer it in that way? It is a credible medical work, isn't it? *A.*—It is credible in certain portions and very uncredible in certain other portions.

Q.—Depending upon whether you agree with the conclusions of those who complied with it, or disagree? *A.*—Not the question of whether I agree or disagree, but the question of the statements being correct or false.

Q.—What is the significance of a drug being named in the United States Dispensatory? *A.*—Nothing at all.

Q.—It don't mean anything? *A.*—Not a thing.

Q.—It means that it is worthless? *A.*—Not necessarily.

Q.—Does it mean that in their opinion, it is beneficial? *A.*—Not necessarily.

Q.—What is the significance of a drug being named in the pharmacopeia or the National Formulary? *A.*—That is something different. A drug named in the United States Dispensatory, or named in the United States Pharmacopeia or National Formulary, rather, means that those drugs are at that time accepted as drugs which may be used under certain conditions when they are indicated therapeutically. Now, there are many drugs in the United States Pharmacopeia, many prep-

arations in the National Formulary that should not be there and unquestionably these drugs will be eliminated in gradually following editions of the Formulary and of the United States Dispensatory. Every edition of the United States Dispensatory changes. Drugs are omitted that were in the previous editions.

Mr. T. J. Scofield:—You mean the Pharmacopeia?

The Witness:—In the Pharmacopeia, yes. Drugs are dropped which were in the previous edition.

Mr. Hough: *Q.*—But, it means that at the time they were put in, it was the consensus of those people that those were valuable drugs. *A.*—No, not absolutely.

Q.—Would they put something in the Pharmacopeia that everybody thought was worthless? *A.*—There are many things that have been in pharmacopeias that everybody thinks worthless, but they have not taken special pains to take them out, but later it will get out. There is always a division of opinion on the question of drugs that go into the Pharmacopeia. I have never been in any Committees connected with the Pharmacopeia and I know nothing about the methods which they follow in deciding as to what drugs shall be presented. But I do know that there are many things that are taken out of the Pharmacopeias and many drugs that are present in the Pharmacopeias that could just as well be out.

Q.—They are used as a basis of teaching to the students of medicine, what drugs are medicinal and how they shall be used. *A.*—In a general way they are used as a basis, yes.

Q.—So that in a general way, when a drug is in the Pharmacopeia anyone is justified in believing that it is a meritorious drug, until proven to the contrary? *A.*—Yes, if used in dosages as, and when indicated, which the Pharmacopeia does not attempt to outline. The pharmacopeia has nothing whatever to do with indications or therapeutics and so on. They have simply the question of drugs that may be used by physicians or which have been used in times past, and the dose, the average dose for the adult is stated. Now, one physician may use a drug that is in the Pharmacopeia, and use it erroneously, when there is no indication whatever. Others may use it and get results. So the thing goes.

Q.—Now you know, of course, that carduus benedictus is official in all of the European pharmacopeias today, don't you? *A.*—I know nothing about the foreign pharmacopeias. I am not interested in that phase of it.

Q.—You know that it is official in the eclectic pharmacopeia of this country, don't you? *A.*—I know nothing about eclecticism.

Q.—You know that it is official in the homeopathic pharmacopeias in this country, don't you? *A.*—I do not. I am not familiar with the homeopathic pharmacopeia, if there is such a book.

Q.—You mean that you don't pay any attention to any literature of any of the other schools? *A.*—Oh, yes, yes.

Q.—You are an allopath, are you? *A.*—I do not know what you mean by allopath.

Q.—I beg your pardon. I believe you do know what I mean. You call yourself "Regular," you prefer to call yourself "Regular." *A.*—That is a term that is applied. It don't mean anything especially at the present time. Physicians practice—if you want to use the word, and I simply use the word in deference to your question—one may become or use medicine in an allopathic form or in a homeopathic form; and you find men, homeopathic physicians, so-called, that practice regular medicine and we find regular physicians that use homeopathy. It is a dividing line that is rather hard to draw.

Q.—You mean that the two schools are coming closer together all the time? *A.*—In certain ways they are. Their principles are somewhat different so far as therapeutics go.

CROSS-EXAMINATION AS TO EFFECTS OF CARDUI ON WITNESS

Q.—Now, when you tested Wine of Cardui for its emetic principles, had you prepared yourself or your stomach in any way before you did that? *A.*—Well, I don't know. I would like to know how one might do it. I will say, no.

Q.—Well, it is a fact that there are many emetics that will act on some stomachs and not on others, isn't it? *A.*—Well, I think most drugs that are called emetics will produce emesis in most any individual, if given in sufficient amounts.

Q.—When did you take the first dose, immediately after breakfast? *A.*—No, the first half bottle that I took of that was somewhere along about 9:30. I do not know that I remember the time, sometime in the middle of the morning.

Q.—Had you had a light breakfast or a heavy breakfast? *A.*—Well, personally, I would call it a moderate breakfast.

Q.—Do you recall what you had for breakfast? *A.*—I cannot remember what I had on that morning, no.

Q.—What would be your usual breakfast? *A.*—I might have had a cereal and bacon and eggs and toast and coffee, something of that sort.

Q.—Would that have a tendency to strengthen the stomach to resist emesis? *A.*—I do not think it is a question of strengthening the stomach to resist emesis. As a chemist I am not qualified to speak as to the mechanism of emesis, or the mechanism of emetic drugs. I will simply say, that to my knowledge the eating of breakfast would perhaps retard the effect, but would not obscure it.

Q.—Now, then, taken internally by you, that taking of it was both for the purpose of determining its emetic effect and for the purpose of determining its physiological action also, was it not? *A.*—Why, I was not going into the general physiological action of the preparation. I was attempting to find whether there was any noticeable effect, visible effect from Wine of Cardui that might be different from the effect from the same amount of alcohol.

Q.—When did you take the second dose? *A.*—That afternoon, about the middle of that afternoon, the same afternoon.

Q.—Did you eat dinner in the meantime? *A.*—Lunch, yes.

Q.—Now, then, how soon after that did you take the same amount of alcohol dilute or in water, diluted in water? *A.*—The next day.

Q.—Or rather diluted with water. How much alcohol was there? *A.*—Well, the bottle would correspond—if I remember correctly it is about an ounce and eight tenths, pretty nearly two ounces of alcohol.

THE COURT:—Doctor, I noticed in one of the newspapers that they quoted you as saying that that alcohol made you giddy. I don't recall that you so testified. Is that the fact?

A.—I did not testify to that yesterday, no. As a matter of fact, the amount of alcohol did not make me dizzy. It made my face flush; made me feel the usual effects of beer, or any alcoholic drink, that such a drink might produce. I do not remember that my tolerance was low enough to produce giddiness. I cannot recall whether it was or not.

Mr. Hough:—It did not make you drunk? *A.*—Well, I am not entering into the pharmacological action of alcohol because I do not know.

Q.—That is a physical fact, is it not? *A.*—I cannot answer your question as to whether it made me drunk without going into much detail. The question of drunkenness is one that is susceptible of a great deal of argument.

Q.—Did you stagger around after you took it? *A.*—Not at all.

Q.—Did you get dizzy? *A.*—No.

Q.—The amount of alcohol was twenty per cent. in what you took? *A.*—The amount in Wine of Cardui is 20 per cent., yes.

Q.—The amount with water would be 20 per cent? *A.*—I do not know if it was 20 per cent. I do not know the amount of alcohol, but I calculated it and added some water to it and took that amount of alcohol. I did not mean it to be exactly 20 per cent.

Q.—What is that? *A.*—I did not mean it to be exactly 20 per cent. I made it up approximately to about four ounces or four and a half ounces. A bottle of Wine of Cardui is approximately nine ounces as I recollect.

Q.—What I want to get at is the dilution. *A.*—It was approximately four and a half ounces, I did not measure it exactly.

Q.—You mean four and a half ounces of water? *A.*—Of water and alcohol; an ounce and eight tenths in the bottle, I think, would be about nine tenths of an ounce of alcohol to four and a half ounces of water or in four and half ounces of water, some such amount of alcohol as that.

Q.—What percentage would you say that was, what percentage of alcohol? *A.*—It is about 20 per cent.

Q.—When you took the Wine of Cardui dose, did it flush your face? *A.*—Yes.

Q.—Was there any burning sensation in the throat by the other, the water and alcohol alone? *A.*—Well, I won't say that there was a burning taste or sensation. There is a difference in the proposition, because you have a taste of a substance which is bitter; it is not a burning sensation, it is a bitter taste. I noticed no special disagreeable sensation. It was perfectly easy to take it.

Q.—It was a pleasant dose to take? *A.*—Well, if I was looking for a pleasant preparation to take, I should not have selected that, no.

Q.—Taking the first dose made you want to take the second dose in the afternoon, did it? *A.*—I don't know that it made me desire to take the second dose. It did not have any influence one way or the other. I had no feeling about the matter.

Q.—No repugnant feeling to taking the second dose at all? *A.*—No. I have taken many drugs and preparations known as non-alcoholic beers, such as "hop-foam," and "hop-cream," sold in various parts of this state and elsewhere, tasting a great deal worse than this preparation, Wine of Cardui.

Q.—Does it not depend a good deal on the stomach as to the effect of any dose, or any medicine, containing the alcohol? Does it not depend on the condition of the stomach and the character of the stomach? *A.*—As to the effect of the alcohol?

Q.—You stated that you observed no physiological effect other than that which was due to the alcohol alone. *A.*—I was trying to get your question, Mr. Hough, I do not understand the bearing of your question.

Q.—I do not know that it is necessary for you to understand the bearing of it. *A.*—Well, I do not understand your question directly.

Q.—When you took the first drink of Wine of Cardui in the form in which it comes in the bottle, you say you observed no other effect on yourself other than that which would be due to the alcohol alone. *A.*—Yes.

Q.—Suppose you had taken a dose of the fluid extract of ergot, would you have noticed any different effect than that due to the alcohol alone? *A.*—I do not imagine that I should have noticed much, except possibly in the pulse pressure and general effects of that kind.

Q.—Ergot contains more alcohol than there is in Wine of Cardui, a larger per cent., does it not? *A.*—What preparation?

Q.—The fluid extract, pharmacopeial. *A.*—Possibly the fluid extract contains more alcohol, but the dose of ergot——

Q.—I am not talking about the dose; I am talking about the percentage of alcohol. *A.*—I cannot answer your question, because as a chemist and physician the amount of alcohol would necessarily follow as to the dose. I would not take half a bottle of fluid extract of ergot.

Q.—Why? *A.*—I would expect to get, in a general way, results that I did not care for.

Q.—That is, it has more alcohol than the other? *A.*—No, I would have more ergot than I wanted.

Q.—How would the ergot act on you? *A.*—I say I am not a therapeutist, or I am not a practicing physician and I am not qualified

as to that. I simply say that I would have more ergot than I would care to take.

Q.—Ergot is supposed to act on the uterus, isn't it? *A.*—It is said to.

Q.—Would you expect it to act on you then, if you took it? *A.*—It has other effects that I would expect. It acts on the uterus through the circulation, and on the muscles.

Q.—If you took any remedy known as a uterine tonic, would you expect it to act on you, as far as the drug was concerned? *A.*—Well, as far as the action on the uterus was concerned I would not look for that effect.

Q.—Then don't you think that it would have been better if you had tried the medicine on a person who had a uterus? *A.*—Not if I wanted to determine the emetic and cathartic effect, and that was what I was interested in.

Q.—But you testified as to the other effect. Now, is it not a well-known fact, doctor, that a whiskey soaked stomach can take more of objectionable ingredients without affecting it, than a delicate stomach? *A.*—I think that is true, but I am not qualified as a whiskey sock.

Q.—Is it not a fact that whiskey soaks have been known to drink alcohol off of an anatomical specimen without nauseous effect at all? *A.*—I cannot say.

Q.—You never heard of that? *A.*—I do not know that I have, no. I have heard stories told.

Q.—Is it not a fact that morphin, for instance, if given to you in a sufficient dose would kill you? *A.*—I do not know whether it would or not. It would depend on whether I was a morphin fiend.

Q.—Then if you were a morphin fiend, you could take more than if you were not a morphin fiend? *A.*—Yes.

Q.—And if you were not a morphin fiend, you might take a lethal dose? *A.*—Yes.

Q.—But you can give many times a lethal dose to a dog, and he will lick his chops and ask for more? *A.*—It depends on whether you give many times more than the lethal dose for a dog.

Q.—I am talking about the lethal dose for a man. *A.*—I would not say that definitely; I don't believe it.

Q.—Have you ever made any tests to see how much would kill a dog? *A.*—I have never determined the lethal dose for a dog. I have given morphin to dogs many times. I do not know what the lethal dose is in that connection, but they may have more tolerance.

Q.—Is it not a fact that you can feed arsenic to hogs without any deleterious effect? *A.*—In certain amounts. You can do that same thing to a human.

Q.—In the same amount it would kill a human, won't it. *A.*—Possibly.

Q.—So it don't always follow that if a certain thing is taken by an individual, without any effects which might be attributed to the drug itself, that it would not have an effect on some other individual differently constituted, does it? *A.*—It does not follow absoutely, Mr. Hough, but it does follow that if you get the effects on the uterus in a woman, that you certainly get indirect effects, circulatory effects and so on, in a man, which could be noted and to indicate that certain effects were possible in a woman, if a man did not get those results, those effects would not be possible or apparent in a woman. There are certain circulatory effects and certain effects of a general nature which a man would have to get.

Q.—What test did you make to see whether there was any circulatory effect on you? *A.*—I took my pulse to see whether it varied, I found my pulse was slightly more rapid, but it did not vary any more from the alcohol than it did from the other. In other words, I could distinguish no effect on the circulation which was different. I would expect to get a variation in blood pressure. I did not take it, it is true, but I gathered from the pulse examination that there would be a very slight variation, if any, in the blood pressure. It might be slightly lower at times.

Q.—Now you stated that you found potassium nitrate in this. *A.*—Yes, I obtained qualitative results. I made no quantitative determination of this factor.

Q.—Would that of itself indicate the origin of it? *A.*—Oh, no. Potassium nitrate might come from any number of preparations or plants.

Q.—This has been referred to as "a weed." Do you know of any other weeds from which useful drugs come? *A.*—Weeds?

Q.—Yes. *A.*—The most of the pharmaceutical preparations are made from herbs and a weed is a herb in a way. Not off hand can I speak of any so-called common weeds. There are some.

Q.—Digitalis comes from foxglove, which is a weed, isn't it? *A.*—Digitalis is one of the preparations that is very widely used in medicine, yes.

Q.—And that comes from a weed also? *A.*—Yes.

Q.—Is it not a fact, doctor, that the term "wine" in medicated wines, refers to substances extracted and held in solution either in wine or dilute alcohol? *A.*—Not pharmaceutically speaking, and not as a standard medical preparation. Wine, medically speaking, is a preparation made from wine which contains the active principles of the drug, the active extractives of the drugs.

Q.—You would say it is not that made from dilute alcohol, that that could not be called a wine? *A.*—I should say not. I would have to know the reason for calling it "wine."

Q.—Is Cushny any authority on that point? *A.*—The fact that Cushny states that it is made from dilute alcohol would not change my opinion.

Q.—Cushny taught in the medical schools, did he not? *A.*—Yes. He is a professor in the University of London at the present time.

Q.—Is Dr. Howard A. Kelly of Johns Hopkins University any authority on the point? *A.*—I should say not, on the question of wine.

Q.—As to what is a medicated wine? *A.*—Not an especial authority. That is not the line of work upon which Dr. Kelly is spending his time.

Q.—You mean to say that if he should state that medical wines refer to the substances extracted by dilute alcohol, that he would not be telling what is correct? *A.*—Not in my opinion. That is the only way I can answer.

Q.—Are you alone in that opinion? *A.*—No, I have two or three followers.

Q.—Has that always been the view? *A.*—I cannot say as to that.

Q.—Is it not a fact that about 100 years ago, the London Pharmacopeia substituted an equal amount of alcohol on the ground of the irregularity in the amount of alcohol in wines, as a more reliable menstruum. *A.*—Possibly 100 years ago; but ten years ago, and more for all I know, the pharmacopeias and other standard works of the United States declared that a wine was a preparation made from wine as such and I have no reference whatever to pharmacopeias of 100 years ago, or 1,000 years ago.

Q.—Would there be any difference in a preparation made from wine, having a certain amount of alcohol, and the same preparation made from alcohol alone, of the same strength. *A.*—Yes.

Q.—What would be the difference? *A.*—One would be a wine and the other would be a pure alcoholic extract.

Q.—I am talking physiologically, or so far as the action of the drug is concerned. *A.*—That would be a question, whether there was any active principle in the wine.

Q.—Is there any active principle in the wine? *A.*—Not in Wine of Cardui.

Q.—In any wine that you know of, other than the alcohol? *A.*—Not any active therapeutic principle that I know of in wine, no.

Q.—Other than the alcohol? *A.*—Some wines may contain tannic acids, which would have certain effects.

Q.—You know that this is Cushny's statement, that a medicated wine is a solution of the active substance in wine or in dilute alcohol? *A.*—I know that Cushny makes such a statement.

Mr. T. J. Scofield:—That is objected to.

The Court:—He has answered it. He says now that Cushny has made such a statement.

Mr. Hough: *Q.*—And you know that statement has also been made by Dr. Howard Kelly? *A.*—No, I do not know that.

Q.—Did you say that there was or was not a volatile principle in carduus benedictus? *A.*—I said there was a volatile substance, I said nothing about a volatile principle.

Q.—In the process you use to reach the residuum you would naturally drive off that volatile substance or principle, whatever it was, wouldn't you? *A.*—Yes.

Q.—You heated it when you went through that process, didn't you? *A.*—Yes, in evaporating it, to drive off the alcohol and retain the solid residue I would.

Q.—Does not heating sometimes change the character of a drug or medicine? *A.*—Yes, heating may change it, depending on certain conditions, heating may change the composition of compounds.

The further hearing of the cause was then adjourned until 2 o'clock the same day.

March 29, Afternoon

The Court met pursuant to adjournment. Dr. Ralph W. Webster resumed the stand.

CROSS EXAMINATION RESUMED BY MR. HOUGH

Mr. Hough:—Just a few more questions, Doctor.

Q.—I see that I have asked you twice a question which I don't think you have answered yet; and this question may be answered yes or no. Do you know a medical book or work published between 1859 and 1910 which says that carduus benedictus is a worthless drug? *A.*—No; nor do I a book which says it is of any value.

Mr. Walker:—Wait a minute; I object to that. I move the last part of his answer be stricken out.

The Court:—Let it be stricken out.

Mr. Hough: *Q.*—Now, is alcohol a preservative? *A.*—Yes; under some conditions.

Q.—In all the cases in which it is used in the pharmacal preparations, is it used as a preservative? *A.*—No.

Q.—In what case is it not used as a preservative, eliminating what you may refer to as the wines? *A.*—The tinctures and the fluid extracts. It is used to extract the principles of the drug. It has not any reference—not incidentally—to the preservative effect of alcohol. Fluid extracts and tinctures are prepared by extraction of the principles of the drug, with alcohol of one strength or another. It is not a question of preservation.

Q.—Then the alcohol is left in, in order to carry the drug that has been thus extracted; is it not? *A.*—Some of the principles are more soluble in alcohol than they are in pure water; some of the principles are soluble in alcohol of one concentration, and not in another.

Q.—I asked you whether or not the purpose of leaving the alcohol in the pharmaceutical drugs was not for the purpose of carrying the ingredients which had been extracted by the use of alcohol? *A.*—Yes; in the alcoholic preparations of the pharmacopeia.

Q.—And that also, in those cases, it does act as a preservative, doesn't it, a menstruum, and a preservative? *A.*—Yes; but primarily as a menstruum.

Q.—Now, I understand you to state that carduus benedictus is partly soluble in water; do you say that it is entirely soluble in water? *A.*—I said nothing about carduus benedictus. I was speaking of the residue from Wine of Cardui.

Q.—Well, you say that everything which is in Wine of Cardui, in the form in which it is sold, is soluble in water, as soluble as in

alcohol? *A.*—I don't say that everything is as soluble in water as in alcohol. I do say that in my experiments, practically the entire residue from the Wine of Cardui was soluble in water, after alcohol had been removed and the material evaporated to dryness, practically the entire amount of residue present, or the total solids, as I called it, in my examination, was soluble in water.

Q.—Now, could you state whether or not any of those residues were resinous? *A.*—Yes.

Q.—Are all resinous products soluble freely in water? *A.*—No.

Q.—Now, then you could not state with reference to anything which your process of reaching the residuum may have driven off, whether that other substance was soluble in water or not; could you? *A.*—No. May I explain my answer, Judge?

THE COURT:—Certainly.

The Witness:—The point shown by my examination is a point which has considerable bearing on the statement which I made regarding potency and activity of this principle of Wine of Cardui, and, therefore, it is necessary that I explain my answer.

Resins are ordinarily insoluble in water. If there had been any resins, any amount present in Wine of Cardui they would not have been soluble in water, and, therefore, it is a fact that whatever resinous principles of viburnum or cnicus benedictus, of a resinous nature, might have been present in the original preparation, they did not enter into the Wine of Cardui as such. There were no resinous products of any moment present in the Wine of Cardui, although they may have been present in the original plant. Otherwise, this residue would not have been soluble in water; and that is the reason which I have not previously brought out for my expression that there were no potent principles in Wine of Cardui; otherwise, there would have had to have been resinous materials present in sufficient amounts to have shown activity; and whatever there was present in the plant was not in the Wine of Cardui. It is not a question of what was in the cnicus benedictus, or viburnum; it is a question of what is in the Wine of Cardui.

Q.—Volatile oils have potent principles, haven't they? *A.*—Some of them.

Q.—You did not examine the volatile oils that were in the Wine of Cardui, did you? *A.*—I did not.

Q.—So you could not say as to that, whether it would have added to the potency or not, could you? *A.*—Yes, because I took some of it in which the volatile oil—assuming that it was there—was present.

Q.—Well, I assume that you stated the fact that you did not have a uterus might have made some difference as to that? *A.*—Only on certain phases of the reputed action.

Q.—In the determination of the alcohol in the Wine of Cardui, did you observe that the distillate became turbid when you reduced it to mark? *A.*—I cannot say definitely about that. My opinion is that there was a slight opalescence; but it was not very marked, in my remembrance. I could not say definitely.

Q.—And you think it would make no difference in the determination of what was present? *A.*—No—well, I think the slight opalescence, if any was present, would not have been due to the presence of anything in the nature of a volatile oil; because this would have been soluble, to an extent that it was present in the alcohol that was driven off.

Q.—Now, do I understand you to say that the definition of medicated wines is solely a matter of opinion? *A.*—No. It is a matter of a standard of generally recognized works on pharmacy; and it is a recognized principle in pharmacopeia that all wines—

Q.—In Cushny's work on Pharmacology and Pharmacy—is that a recognized standard work? *A.*—Not on pharmacy, no.

Q.—It is on pharmacology? *A.*—Yes. I would consider it such.

Q.—Would you say, if he states—I refer to Cushny on Pharmacology or Therapeutics or the action of drugs; would you say, if he states, with reference to medicated wines, that it is a drug extracted by dilute alcohol alone, that you would not regard that as anything more than a matter of opinion? *A.*—I would say that it had no basis in fact. It is a statement of Cushny's and not a statement based on any authorities.

Q.—No matter what the London Committee on Pharmacopeia did, one hundred years ago? *A.*—No, I would not consider that was binding at the present time. You know, changes are made, many changes, in the pharmacopeia, every ten years.

Q.—But as to the pharmacopeia, as it exists now? *A.*—I would say it had no reference to that made 100 years ago, at the present time.

Q.—But if it continued to this day? *A.*—Well, I know nothing—as I said in answer to one of the other questions—regarding the pharmacopeias of other countries.

Q.—Would it have any effect on your opinion? *A.*—Not as regards the standards in the United States.

Q.—And you think the standard in England might be different from the standard in the United States? *A.*—It is; in certain strength of drugs anything that indirectly—

Q.—I mean as to what would be medicated wine? *A.*—Yes. Standards for the United States are different from—may be different from those of England and France and Germany. It has no bearing on the preparations in this county.

Q.—I am not talking about anything that is official; the question is with reference to whether—if the words were descriptive, whether they would be a proper description? *A.*—I should say not for the United States.

Q.—You say no—not for the United States? *A.*—No.

Q.—But it might be for England or Germany? *A.*—Or where that pharmacopeia was accepted as standard.

Q.—Now, your view is the same with reference to the definition of the word mawkish; it makes no difference what the dictionary says mawkish means, if it says it means nauseous—it is simply a question of opinion, as between you and the dictionary; is that the idea? *A.*—No, no—

Mr. T. J. Scofield:—Wait a minute, if the Court please. He explained that yesterday.

THE COURT:—Yes. He explained what he meant by "mawkish."

Mr. T. J. Scofield:—And the sense in which he used the word.

Mr. Hough: Q.—The word "mawkish" is defined as meaning—

THE COURT:—The witness told you what meaning he thought it had and the meaning he used in his examination. In other words, he gave his own definition and used it in that sense.

Mr. Hough:—That is all.

RE-DIRECT EXAMINATION BY MR. SCOFIELD

Q.—Doctor, in your examination in chief, and I think also in your cross-examination, you have sometimes used the words "viburnum prunifolium," and sometimes "viburnum"; when you use the word "viburnum," to what did you refer? *A.*—Viburnum prunifolium.

Q.—So that in the instances where you have used the word "viburnum" alone, you mean "viburnum prunifolium"? *A.*—Yes, sir.

Q.—As to idiosyncrasies, doctor, towards nausea; have you any such thing as that? *A.*—No, I have not. If I have any idiosyncrasy it is rather a marked susceptibility for certain drugs producing nausea rather more easily than it would normally.

Q.—Doctor, in your direct examination, in speaking of valerian acid, and the source from which it may come, did you mean to say—did you or did you not mean to say that valerianic acid is contained in cnicus benedictus, or cnicin? *A.*—No. I meant to say—if I did say that it was present in these preparations, I am in error; because there is no valerianic acid in cnicus, or cnicus benedictus.

Q.—Now, in speaking of solubility of cnicin, what is the fact, as to whether or not cnicin is, in its absolute and pure state, soluble or insoluble in ether? *A.*—It is stated to be insoluble in ether, in absolutely pure condition—difficultly soluble—nothing is absolutely insoluble in certain menstruums.

Q.—Then, if in answer to that question yesterday you said "soluble" you did not mean to say that; is that the idea? You mean to say insoluble or soluble? *A.*—If you refer to a statement made regarding cnicin being insoluble in ether under the conditions of the test, it might be rendered soluble by the presence of other conditions. I meant that it was insoluble in ether. I do not know what the point is involved.

Mr. T. J. Scofield:—That is all, Doctor.

Mr. Hough:—That is all, Doctor.

Mr. T. J. Scofield:—Dr. Hilpert.

TESTIMONY OF DR. HILPERT

Dr. Willis S. Hilpert was called as a witness for the defendants.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Willis S. Hilpert stated he is a chemist; he received the degree of Bachelor of Science in the University of Chicago in 1903, and the degree of Doctor of Philosophy in the same institution in 1906, studying in chemistry. He is at present connected with the Miner Laboratories. Previous to Jan. 1, 1916, he had been connected with the Laboratory of the American Medical Association. He analyzed four specimens of Wine of Cardui, which he purchased on the open market and then mixed. He described his work saying:

I took the four bottles of the Wine of Cardui, thoroughly mixed them, and shook up each bottle, so as to get all suspended matter uniformly distributed. Then I carefully mixed the contents of the four bottles, and then used that mixture as the basis of the analysis. I determined the mixture—I found the Wine of Cardui to be a brown liquid, having an odor—a slight odor of valerian, an alcoholic odor and a bitter taste. I determined the alcoholic content and found it to be about twenty per cent. I determined the total solids and found them to be about three per cent.—slightly less, I believe.

I tested for such potent substances as mercury, arsenic, copper, zinc, antimony and such; and alkaloids, such as morphin, strychnin, cocain, quinin, and found none of these present. I tested for emetic drugs, such as ipecac, tartar emetic or—tobacco—and found none present. I tested for such substances as iodids and bromids, and found none present.

I tested for substances such as tartaric succinates and glycerin, which would be present if this substance had been made from wine; and found none of them present.

I found small traces of iron, calcium, magnesium, sodium and potassium.

I determined the total nitrogen contained, and found it to be .46 per cent. of the entire—.46 drams per 100 c.c., or practically three ounces.

To sum up: I found no potent substances; by potent I mean any substance having marked physiological action; other than alcohol.

Mr. Walker:—I want to make an objection to that, and move that it be stricken out, upon the ground that whether a thing is potent, is a therapeutic question and not a chemical question.

THE COURT:—That may be stricken out.

To which ruling of the Court the defendants, etc., excepted.

Dr. Hilpert also testified that he tested for the so-called emodin bearing drugs, and found none present. He took five tablespoonfuls of Wine of Cardui at one time.

Evidence was interrupted through objection of the attorneys for the plaintiff on the same grounds as in the case of Dr. Webster. The Court overruled the objection and the usual exception was taken.

Dr. Hilpert then answered:

In taking the five doses of Wine of Cardui, I noticed the bitter taste and the burning sensation of the alcohol—the alcohol—or a burning sensation in my mouth and throat; later in the region of the stomach; and later a slight flushing of the face.

Under the same conditions and the same time of day, on the following day, I took the same quantity of alcohol in water, containing the same amount of alcohol as was present in the Wine of Cardui. I found the same—I experienced the same sensations in every respect, excepting that in the case of the alcohol water mixture, the burning sensation in the mouth was probably a little more pronounced; while in the case of the Wine of Cardui, there was the added bitter taste.

THE COURT:—You did not get the bitter taste from the watered alcohol?

The Witness:—No, sir, no, your Honor.

Mr. T. J. Scofield: *Q.*—Now, did it produce emesis? Did you vomit, or were you sick?

Objection was then taken to the introduction of such evidence and was overruled. The witness answered:

A.—I experienced no other sensations than those I described — no nausea.

Q.—Was there any cathartic effect?

THE COURT:—He said he experienced no other sensations than those he has described; he has told us those.

Mr. T. J. Scofield:—I understood that, Your Honor.

Q.—Now, did you take Wine of Cardui de-alcoholized? *A.*—Yes, sir.

Mr. Walker:—Wait a minute; I object to that. I wish to renew my objection as to the cathartic.

THE COURT:—Yes.

Mr. Walker:—Because neither the cathartic or emetic is set up in the plea, or special plea.

THE COURT:—There is no answer. You may strike out any reference to emetic or cathartic in the testimony of this witness. He has told us all the sensations that happened to him, and said there were no others.

Mr. T. J. Scofield:—All right, Your Honor.

Q.—Did you take any Wine of Cardui after alcohol had been evaporated? *A.*—Yes, sir.

Q.—What was it that you took, the— *A.*—I took Wine of Cardui, five doses again—the same amount—from which the alcohol had been evaporated.

Q.—What effect, if any, did it produce? *A.*—None whatever.

THE COURT:—How did it taste?

The Witness:—Bitter.

Mr. T. J. Scofield: *Q.*—After you had driven off the alcohol, did you find that that which remained, or the residuum was soluble in water, or otherwise? *A.*—Practically all soluble, all except a very small sediment —very small.

Mr. T. J. Scofield:—That is all, if the Court please.

CROSS-EXAMINATION BY MR. WALKER

On cross-examination the witness testified that he first tested to find mercury, arsenic, copper, antimony and zinc. He then tested for alkaloids, morphin, strychnin, quinin and cocain. He then testified that he sought the emodin bearing drugs and found none. He was then asked:

Mr. Walker:—Now, Doctor, will you be kind enough to tell the jury what you did find— *A.*—I found—

Q.—in your test? You understand, as distinguished from what you did not find? *A.*—Yes, sir. I found twenty per cent. alcohol; 2.88 per cent. solid residue, and 0.68 per cent. of ash—the entire substance evaporated down and ashed, burnt up, left that amount of residue. I found some slight amount of suspended matter.

Q.—Well, what do you mean by suspended matter? *A.*—Matter not in solution.

Q.—Anything else? *A.*—Water, and the slight odor of valerian-like substance.

Q.—How did you get at the 2½ per cent. of residue? *A.*—2.88 per cent. residue.

Q.—Well, whatever it was. How did you get at that? How did you find it—how did you get to it? *A.*—Took a definite measured amount of Wine of Cardui.

Q.—How much did you take? *A.*—I think 25 c.c., cubic centimeters; not quite an ounce; evaporated it to dryness in a weighed dish and weighed the residue.

Q.—When you evaporated it, that would release all the volatile oils, wouldn't it, and all the volatile substances? *A.*—Yes, sir, those that would be volatile at that temperature, yes.

Q.—Well, what temperature did you use? *A.*—Between 90 and 100 centigrades, or a little below the temperature of boiling water.

Q.—Now, what volatile oils would be left, if any, on this fluid, with the use of that temperature? *A.*—Well, it would depend on how long the process of evaporation had been continued.

Q.—Well, you know how long you continued your process; I am talking about this—at the temperature in which you operated? *A.*—None that I can think of now would be left.

Q.—Now, take the residue. Could you tell what that was? *A.*—I did not examine it in detail.

Q.—Well, do you want the jury to understand now that from your examination, whether in detail or otherwise, you could tell what it was. *A.*—As far as my analysis goes, it appeared to be extracted matter, organic in nature, which could be destroyed by heat; largely soluble in water, and containing none of the substances which I have enumerated.

Q.—Which you found were not there? *A.*—Yes, sir.

Q.—Now, Doctor, I understand that you took some—made some experiment on yourself? *A.*—Yes, sir.

The witness was again asked concerning the securing of the Wine of Cardui which he tested and as to his methods. He testified that the taste was bitter. He was asked:

Q.—How long did the taste stay in your mouth? I mean that you took with the tablespoonsful—when you took five tablespoonsful; how many hours did the taste remain? *A.*—Why, as far as I remember, I took it and forgot it, as far as the taste was concerned.

Q.—You have no lack of sensibility of taste; have you? *A.*—Not that I am aware of.

Q.—You say you took four tablespoonsful and lost sight of the taste, and you cannot tell me at what time the taste disappeared?

Mr. T. J. Scofield:—Five tablespoonsful.

Mr. Walker:—Five, was it? *A.*—Five, yes? No.

Q.—I suppose it would taste just as bad with five, as one; but I want to know how long that taste lasted, as you recall it? *A.*—I don't recall exactly how long—

Q.—All right. *A.*—but it did not last very long.

Q.—Now, do you have any recollection of whether the sediment that you found, the taste of that, lasted longer than the medicine, the bitter taste? *A.*—No.

Q.—Did you take your pulse before and after taking the medicine in the dosage? *A.*—I—

Q.—Did you? That is all I ask you—did you? *A.*—No.

Q.—Did you take your pulse before or after you took the sediment? *A.*—No, sir.

THE COURT:—Let me understand. Did you swallow this sediment, or spit it out, after you tasted it?

The Witness:—No; I swallowed it.

Mr. Walker: *Q.*—And you swallowed the liquid, too? *A.*—The whole business, yes.

Q.—And the liquid gave you a different sensation in the throat, as I understand you, than the alcohol that you took two days later? *A.*—There was a difference, yes.

Q.—Yes. Well, what was the difference? *A.*—The difference was this: in taking the straight alcohol, mixed with water, there was nothing else to impress my mind as to sensations; in taking the Wine of Cardui, there was the sensation of bitterness, which impressed me at the same time; and, probably the two coming together made the sensation of the alcohol seem less; that is, impressed me less.

Q.—That is, the sensation of the alcohol, when you took the medicine, impressed you less than when you took the straight alcohol? *A.*—Yes, sir.

Q.—Yes. But the most pronounced thing, when you took the medicine, was the bitterness of it, wasn't it? *A.*—No, I should say the both —both are very pronounced.

THE COURT:—When you say both, what do you mean?

The Witness:—The bitterness and the sensation of the alcohol. As I could—I experienced them simultaneously, as soon as I took the substance in my mouth—

Mr. Walker: *Q.*—Tell us what the sensations were you had, outside of the bitterness, please? *A.*—Burning in the mouth and throat; and later sensation of warmth in the region of the stomach.

Q.—Yes. *A.*—That is all; that is as far as the test—and later flushing of the face.

Q.—Hot water would do that, wouldn't it? *A.*—Not the same kind of burn.

Q.—This was a different burn? *A.*—Yes, sir.

Q.—When did you take the medicine? *A.*—Do you mean the exact date?

Q.—Oh, approximately; was it before you made the chemical experiment in November, 1915, or afterwards? *A.*—It was at the conclusion of the chemical work.

Q.—That is, you waited until you got the residue from your chemical test, and then you made both the experiment with the medicine, and then the— *A.*—With the alcohol.

Q.—and then with the sediment; is that right? *A.*—Yes, sir.

Q.—And then later with the alcohol? *A.*—Yes, sir.

Mr. Walker:—That is all.

RE-DIRECT EXAMINATION BY MR. T. J. SCOFIELD

The witness was asked whether he had ever heard the claim made that this preparation contained any other thing than alcohol.

Objection was made and sustained.

TESTIMONY OF DR. M'ABEE

Dr. William D. McAbee was called as a witness for the defendants.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. William D. McAbee testified that he has been Assistant Chemist of the Indiana State Board of Health for seven years; attended the Case School of Applied Science at Cleveland, Ohio, 1906 and 1907. He tested samples of McElree's Wine of Cardui, purchased in the open market. The chemical examination agreed with those previously reported.

Objection was again made by the attorneys for the plaintiff to the introduction of testimony to the effects of Wine of Cardui on the male. Objections were overruled and the attorneys for the plaintiff excepted.

He took an entire bottle of Wine of Cardui during the morning and noticed that the face was flushed and there was perspiration.

The witness produced photographs of labels on six different bottles of Wine of Cardui purchased in the open market. These were introduced as exhibits. The witness promised to produce the original labels.

Mr. T. J. Scofield asked:

Q.—Now, Mr. McAbee, will you state the result of your second analysis. *A.*—I analyzed all of those together—that is, in a series, and at the same time—to detect whether or not there was any difference in the composition of the medicine which agreed in any way with the change of the label; and I found that in two of the samples there was no valerian odor—which was a distinct difference from the other; and also in one sample there was but fifteen per cent. alcohol, while the others contained approximately twenty. Those were the main differences.

The witness then identified the preparations containing the varying ingredients.

Mr. T. J. Scofield then asked:

Q.—Mr. McAbee, tell the jury whether or not alcohol is necessary for a solution of the residuum which you found on this analysis or any of the analyses? *A.*—It is not.

Q.—Did you find in any of the samples that you analyzed the presence of any wine? *A.*—No.

Q.—Tell the jury whether or not Wine of Cardui is a wine. *A.*—It is not.

Q.—Mr. McAbee, have you ever analyzed any samples of beer? *A.*—I have.

Q.—How many have you analyzed? *A.*—About 500.

Q.—Will you tell the amount of alcohol in beer by volume.

Mr. Walker:—Objected to.

THE COURT:—Well, in the beer that he examined.

Mr. T. J. Scofield:—Yes, that he analyzed.

Mr. Walker:—No, in any beer. The fact that they state, for instance, in the article, at some phase of it, that it contained in four doses, tablespoonfulls, as much alcohol as there would be in two thirds of a bottle of beer, is not a part of the attack in this case.

THE COURT:—You don't claim then that was libelous?

Mr. Hough:—No, it is a fact; it is not libelous.

Mr. Walker:—It is a fact.

Mr. Hough:—It is a fact, it is not libelous; but it is immaterial.

THE COURT:—Well, if they admit it is a fact, and make no claim that it makes a part of the libelous matter; you don't have to prove it.

Mr. T. J. Scofield:—No.

Q.—Now, Doctor, have you ever made an analysis of wine? *A.*—I have.

Q.—About how many samples of wine have you analyzed?

Mr. Walker:—That is objected to.

THE COURT:—This is merely a qualification, Mr. Walker.

Mr. T. J. Scofield: Q.—How many samples of wine have you analyzed? *A.*—About 100.

Q.—Will you tell the jury what the average per cent. of wine is alcohol, by volume. *A.*—About twelve—

Mr. Walker:—That is objected to. Wait a minute.

THE COURT:—Now, what is the statement here about wine?

Mr. Hough:—All we want to make is it is wholly immaterial how much alcohol there is in any wine; or in beer, or in—

Mr. Walker:—Whiskey—

Mr. Hough:—Or in any other substance whatever, or in any of the pharmacopeial preparations. What difference does it make to us, if he testifies that some of the pharmacopeial preparations contain 90 per cent. alcohol or only 10 per cent.; it has nothing to do with this case.

THE COURT:—This article contains some very plain facts, and statements of what purports to be facts. Some of those things were charged to be libelous. Now if a statement was made comparing this with wine, as to the amount of alcohol, and that statement is charged to be a part of the libelous matter, they are entitled to show whether that is true or not.

Mr. Hough:—We don't charge that as a part of the libelous matter, and they are not entitled to prove anything else that might be in the article other than the things that we charge to be libelous. That is the point.

Mr. T. J. Scofield:—Now I don't care to go ahead with these questions, your Honor. The same thing is true of whiskey. I am going to ask whether he ever analyzed whiskey to ascertain the quantity of alcohol by volume.

Q.—Have you ever analyzed whiskey for the purpose of ascertaining the amount of alcohol by volume?

Mr. Walker:—Now that is interesting and curious, but we object to it because it is immaterial, and we object for the same reason.

THE COURT:—He may answer.

The Witness: A.—I have.

Mr. T. J. Scofield: Q.—What did you find the average per cent. of alcohol in whiskey to be by volume?

Mr. Walker:—That is objected to. We are not making any claim—

THE COURT:—Well, as I recall it the article referred to this medicine as booze, or a tipple.

Mr. Loesch:—That is libel they charge.

THE COURT:—Just a minute, Mr. Loesch. That is what they charged to be libelous. I think under the circumstances this question is quite pertinent. He may answer.

To which ruling of the Court the plaintiffs, etc., excepted.

The Witness: A.—Fifty per cent.

Mr. T. J. Scofield: Q.—What is the equivalent of whiskey in a single dose of Wine of Cardui, as to alcohol content?

Mr. Walker:—Objected to.

THE COURT:—He may answer.

To which ruling of the Court the plaintiffs, etc., excepted.

THE COURT:—That is, the dose, as I understand it, for the purpose of this trial, is one tablespoonful.

Mr. T. J. Scofield:—One tablespoonful.

Mr. Walker:—There is no use of repeating the reasons always for the objections. We have stated them once.

THE COURT:—No, this objection will be preserved in the record.

The Witness: A.—Very nearly one teaspoonful.

THE COURT:—Read the question and answer.

(Last question and answer read as follows:

"*Q.*—What is the equivalent of whiskey in a single dose of Wine of Cardui as to alcohol content? *A.*—Very nearly one teaspoonful.")

Mr. T. J. Scofield: Q.—What is the per cent. of alcohol in whiskey, you say?

Mr. Walker:—I object. He said fifty per cent.

Mr. T. J. Scofield: Q.—That is the average? *A.*—Average.

Q.—Now how does the alcohol in a dose of Wine of Cardui compare with the alcohol in a like amount of whiskey?

Mr. Walker:—That is objected to.

THE COURT:—Isn't that a question of mathematics?

Mr. Walker:—That is all it is your Honor. Twenty per cent. and fifty per cent.

THE COURT:—One is twenty per cent and the other is fifty per cent.

Mr. T. J. Scofield:—I think it is. That is all, Doctor.

CROSS-EXAMINATION BY MR. WALKER

The witness testified on cross examination as to the time he purchased and used the five bottles of Wine of Cardui. He also testified that he did not find cimicifuga, aletris, or caulophyllum. He again testified as to the contents of the six specimens.

REDIRECT EXAMINATION BY MR. T. J. SCOFIELD

Q.—Dr. McAbee, do you desire to make any corrections in anything which you have said? *A.*—I do. I stated that one dose of Wine of Cardui was equivalent to very nearly a teaspoonful of whiskey. I should have said that it is equivalent to one and three-fifths teaspoonfuls of whiskey. Much more than one.

Mr. T. J. Scofield:—Anything else? Is that all, Doctor? *A.*—That is all.

Mr. T. J. Scofield then read in evidence the contents of the six photographs of labels produced by Dr. McAbee.

TESTIMONY OF DR. MILSPAUGH

Dr. Charles M. Milspaugh was called as a witness for the defendants.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Charles F. Milspaugh testified that he is head of the Department of Botany at the Field Museum and has held this position for twenty-two years. He identified two specimens: one as carduus benedictus, the other as marian-marianus.

Mr. T. J. Scofield asked:

Q.—Now, is that the plant—this last exhibit—that is sometimes called carduus marianus? *A.*—It is.

Q.—You are familiar with both of these plants, are you? *A.*—Both of the names, yes, sir; same plant.

Q.—Can you tell us in what respect these plants are related to each other botanically? *A.*—That is between benedictus and marianus?

Q.—Yes. *A.*—They are very closely related, both being thistle, and the same relationship that we would expect to find between wheat and oats for instance.

CROSS-EXAMINATION BY MR. HOUGH

Q.—Doctor, this is the seed of one, isn't it, this exhibit (the second) that is the seed? *A.*—That is the seed, yes, sir.

Q.—There are no seed in that, are there? (Apparently referring to the first exhibit.) *A.*—There may be in the heads. The flowering heads are there. They may be immature and not developed, or they may be mature.

Q.—Can you say how similar the seeds of this (apparently referring to the first exhibit) would be to the seeds of this (apparently referring to the second exhibit)? *A.*—This (apparently referring to the second exhibit) being marianus?

Q.—Yes. *A.*—And the other being benedictus?

Q.—Yes. *A.*—I can tell you from an observation of other specimens, yes, sir.

Q.—Well, I say, how similar would the seed of this be to the seed of this (referring to the two exhibits). *A.*—About the similarity that there is, as I say, between wheat and oats.

Q.—Between wheat and oats? *A.*—Yes, sir.

REDIRECT EXAMINATION BY MR. T. J. SCOFIELD

On redirect examination Mr. Scofield asked the witness whether he has had experience as a botanist, from which he could derive knowledge as to the part of carduus marianus used in the preparation of drugs.

The witness answered that he had.

Objection was made.

The court then asked:

THE COURT:—Let us get at the source of his knowledge and then we will learn very quickly.

Mr. T. J. Scofield:—What is the source of your knowledge? *A.*—I am a physician and I have been a physician, and was educated as a physician and also I have been particularly engaged in the handling of all sorts of plant products for the last 22 years, or, in fact, really 40 years.

Q.—For what purpose? *A.*—For the purpose of distinguishing between the sources of products, such as drugs, gums, herbs, tans and dyes and everything of that character, all products of plants.

Q.—Are you able to say then whether or not in the manufacture of medicine, they use the seed or the stem or bark of the plant known as carduus benedictus, or carduus marianus? *A.*—In the case—

THE COURT:—Confine yourself to such medicines as you are familiar with, so that you are speaking to a question of fact.

The Witness: A.—In the case of marianus, the seed is used. You asked also in the case of benedictus?

Mr. Scofield:—Yes. *A.*—In that case, sometimes the whole herb, mostly the leaves and flowering head.

RECROSS-EXAMINATION BY MR. HOUGH

Mr. Hough asked the witness as to what he meant by "common use," which the witness defined. The examination continued:

Q.—For how long has it been used as a medicine? *A.*—You are speaking now of either one or both?

Q.—Either one or both. *A.*—Of either one or both. They have been used, I think, very probably since the time of Dioscorides.

Q.—You mean several hundred years? *A.*—Yes, sir.

Q.—And they were used for substantially the same thing? *A.*—No, I think not, if my memory serves me.

Q.—What? *A.*—If my memory serves me, they were not used for substantially the same thing, no.

Q.—What was each used for? *A.*—In the case of benedictus, the leaves and the flowering tops and so on, were mostly used as a light tonic.

Q.—As a uterine tonic? *A.*—Beg pardon?

Q.—As a uterine tonic? *A.*—No, I should not say uterine tonic from my knowledge.

Q.—Isn't that what your reading tells you on the subject? *A.*—No, not as I remember it.

Q.—What was the carduus marianus used for? *A.*—The carduus—the seeds of the carduus marianus—were used more particularly for female troubles.

Q.—Didn't the authorities state that they were both good for the same thing? *A.*—Not to my knowledge.

Q.—Have you ever made inquiry among the different pharmaceutical houses of the United States to see whether they make a fluid extract of carduus benedictus or not? *A.*—I have not.

Q.—Then upon what do you base your statement that those who use it as medicine, use the flower and stem? *A.*—Why, my knowledge of the history of drugs.

Q.—What is your knowledge based on? *A.*—On reading.

Q.—What have you read on that subject? *A.*—Well, I have read undoubtedly, although I cannot state absolutely now, the titles of all the works I have read in the course of the necessities of my work—probably most of the works from Dioscorides to the present day.

Q.—Do you mean to say that none of them recommend it as a uterine tonic? *A.*—I cannot say exactly what each one says. In my character of work we refer to books when we need information.

Q.—Would you say that none of them recommended carduus benedictus as a uterine tonic? *A.*—I cannot say.

Q.—But you do know that they recommend the other thistle as a uterine tonic? *A.*—The marianus?

Q.—The marianus. *A.*—Yes, sir. I do not say, a uterine tonic; I said in female troubles.

Q.—In female troubles? *A.*—And that had a very broad acceptation of the term in those days.

The further hearing of the cause was then adjourned until 10:30 o'clock the following day, March 30, 1916.

March 30, Morning

The court met pursuant to adjournment on March 30, 1916.

TESTIMONY OF DR. PAUL NICHOLAS LEECH

Dr. Paul Nicholas Leech was called as a witness on behalf of the defendant. He testified as follows:

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Paul Nicholas Leech testified in reply to questions that he resided in Chicago, attended Miami University, graduating in 1910 with the degree of A.B., having specialized in chemistry. In the University of Chicago, he received the degree of Master of Sciences and Chemistry and the degree of Doctor of Philosophy in Chemistry. He has been employed as a chemist in the chemical laboratory of the AMERICAN MEDICAL ASSOCIATION since Oct. 6, 1913, doing analytical chemistry chiefly. He analyzed samples of McElree's Wine of Cardui which he received in the original cartons. He took four samples, mixed them well in their individual bottles and poured then into the fifth container in order to get a uniform sample. In reply to questions:

Q.—Go ahead and state results of the analysis which you made? *A.*—It had a valerian-like odor. I found alcohol to be present in the amount of 20 per cent. The solid residue varied in different samples, but the average was in the neighborhood of three per cent. The solid residue was composed mostly of organic matter and the ash—as in most organic matters, contained substances that are inflammable, carbon—just like when you burn wood, you get a residue in the ash, so that when you burn the residue from Wine of Cardui, you get an ash and this ash was .75 per cent. It contained minerals in very small quantities such as iron, potassium and soda. The amount of calcium was .75 of one per cent. The amount of sodium calculated as sodium carbonate was .24. I tested for tartrates; none were present, indicating an absence of wine. Emodin bearing drugs were not present. I tested for alkaloids and found no alkaloids. This would exclude the presence of a considerable number of potent drugs, such alkaloids as strychnin, hydrastinin, quinin, emodin, etc. I found that the volatile matter present was equivalent to four one thousandths of one per cent., in other words, 0.004 per cent. This volatile matter—that is the amount of volatile matter otherwise than steam or alcohol.

Q.—Did you determine the amount of alcohol? *A.*—The amount of alcohol was about 20 per cent.

Q.—Did you determine the amount of water? *A.*—I did not determine the amount of water.

Q.—Did you make a determination of the percentage of iron which was present? *A.*—The amount of iron in Wine of Cardui was six ten thousandths of one per cent. or 0.0006 per cent.

Q.—Is alcohol necessary for the solution of the residuum which was found? *A.*—It is not.

Q.—Now, in the examination which you made, did you find anything which is characteristic of cnicin? *A.*—I did. A yellow amorphous substance was obtained from Wine of Cardui after Wine of Cardui had been subjected to such treatment as the evaporation of the alcohol and shaking with ether and the ether portion was taken off, the ether evaporated and the residue left. Upon treating an

extract of Carduus benedictus made in the same manner, one obtains a like identical residue. This residue has been described here as cnicin.

Q.—Did you take any Wine of Cardui yourself, either before the alcohol was evaporated off or after it had been evaporated off? *A.*—I took four doses. A dose of Wine of Cardui, as it appears on the label is one tablespoonful which is approximately the equivalent of four teaspoonsful. I took four doses which would be equivalent to 16 teaspoonsful of Wine of Cardui in one dose.

Mr. T. J. Scofield then asked the witness:

Q.—After you had taken the Wine of Cardui, what effect followed, so far as you noticed upon yourself?

Objection was then made to use of the word "effect" and it was eliminated.

Attorneys for the plaintiffs also objected to questions regarding action of Wine of Cardui on the male, claiming that such evidence was not admissible because:

"that is not the way it is prescribed, or the dosage that is recommended and the effect of drinking it by a half bottle, by a man, is also not in this case, because the charge is here that it is in vogue among women who take their booze in the nature of patent medicine, and the application of it to a man or to his organs and as to its effect on him has no part in this case under the pleadings."

THE COURT:—This is the same question we had up yesterday, and it is not necessary for the court to reiterate his reasons for overruling the objection. You may answer, Doctor.

To which ruling of the court the plaintiffs, etc., excepted.

A.—There was a warming sensation in the region of my stomach; I had a flush in the face and what I should be pleased to term a headiness.

THE COURT:—A what? *A.*—A headiness, a fullness in the head; not quite dizzy but nevertheless bordering on to what I would call dizziness.

Mr. T. J. Scofield:—Was it a difficult thing to take, Doctor? *A.*—It was not so very difficult a thing to take.

THE COURT: *Q.*—Did you like it? *A.*—I did not like it, but I do not like alcohol in any form.

Mr. T. J. Scofield: Q.—Doctor, did you take any pure alcohol? *A.*—I did take pure alcohol. I took an equivalent quantity of pure alcohol, four tablespoonsful, 64 c.c. of 20 per cent. alcohol.

Q.—What did you notice, so far as you yourself was concerned after you took it, if anything? *A.*—Practically the same—I noticed practically the same feelings as I described with Wine of Cardui, except I had a little more difficulty in taking the alcohol than the Wine of Cardui.

THE COURT: *Q.*—What space of time elapsed between the time you took the Wine of Cardui and the taking of the alcohol? *A.*—Probably two or three days.

Mr. T. J. Scofield: Q.—Now, Doctor, did you make more than one analysis of Wine of Cardui? *A.*—I did not make more than one rather complete analysis of Wine of Cardui. I did make more than one analysis when it came to determining the substance of the ash, determination as to the residue, the ash, etc.

Q.—When did you make the analysis that you now have described or told us of? *A.*—Between February and May, 1915.

Q.—Last year? *A.*—Yes, sir.

Q.—Now, having torn down Wine of Cardui and separated it into its parts, did you at any time undertake to build Wine of Cardui up? *A.*—Yes, I did, over quite a considerable period.

Q.—When? *A.*—I made various preparations by using carduus benedictus and viburnum prunifolium in varying amounts, making them according to various different methods, such as an infusion and in alcohol, afterward percolating with 20 per cent. alcohol—in fact, I made a great number. I might say that all during this time I more nearly approached a substance identical with Wine of Cardui. Finally I did get a substance identical with Wine of Cardui by taking about 12 per cent. of carduus benedictus, unchopped, and about 1.4 per cent. of viburnum prunifolium, bark of the stem, and percolating this over night with 100 c.c. of 20 per cent. alcohol. Then treating this with about .24 per cent. of sodium carbonate and adding caramel which is the color of Wine of Cardui on the market and which I found to be in it about the amount of .2 per cent.

Q.—Now, Doctor, after you had built up this preparation, did you at any time analyze that? *A.*—I did, and found that the analysis corresponded to the analysis of Wine of Cardui.

Q.—That is as to the residuum? *A.*—Yes, sir.

THE COURT: *Q.*—Do you mean only as to the residuum, or as to all the experiments you made? *A.*—As to all the experiments, the amount of alcohol, the residue, the ash and the presence or absence of the different substances and so forth.

Mr. T. J. Scofield: A.—Now, what do you mean when you say it gave a corresponding result with the product which you had examined, which you bought on the market. Explain that. *A.*—The odor of the two products was alike.

Q.—I beg your pardon. Did you go into that, Doctor, and explain that? *A.*—Partially I did, yes.

Q.—Well, let us have it fully. *A.*—The odor of the two products was alike. The color of the two products was alike. For instance, in Wine of Cardui, where I ran the determination parallel, that is, if I were to run the determination on the synthetic Wine of Cardui, I would run a determination on real Wine of Cardui alongside of it, so that both would be done under exactly the same conditions and so that there would be a fairness and exactness in both conditions. For instance, in Wine of Cardui, in one determination, I got 3.27 residue; in the synthetic I got slightly less, 3.06.

Q.—When you say "synthetic" what do you mean by synthetic? *A.*—Synthetic as I would explain it is the antonym of analysis. Analysis means breaking down or tearing apart into small parts. Synthetic means building up, taking those component parts and constructing something.

Q.—So that you distinguish one as Wine of Cardui and the other as the synthetic preparation? *A.*—The synthetic preparation which I have designated all along as "Formula A." I have called it "Formula A." In other times when we have made these preparations sometimes the residue from Formula A was a little greater than the residue from Wine of Cardui; but the variations were not material and they were no more than the variations between different samples of Wine of Cardui itself. When a product such as this is made, the variations are not important, as different batches may vary.

Q.—Why is it that different batches may vary, do you know, Doctor? *A.*—Different batches might vary because of the time when the weed or the herb was collected. At different seasons they would give different amounts of extractives. There may be a small amount of dirt or clay that would be in the weed and consequently would give a little greater amount of residue. There are many factors which, in the making of a pharmaceutical preparation (such as Wine of Cardui is) would not be considered important.

Q.—Then it is true that in Wine of Cardui itself, in the preparation, there is some variation by reason of those things, is that right? *A.*—Yes, sir; that is correct.

Q.—Now, how much residue did you get from the analysis of Wine of Cardui, McElree's Wine of Cardui? *A.*—It averaged around three per cent. One instance I can remember, 3.44 per cent. and in another instance, 3.26 per cent.

Q.—How much residuum did you get from the preparation which you built up that you designate as the synthetic preparation? *A.*—In one instance I got 3.06, that I recall now.

Q.—Now, Dr. Leech, did you never make a determination of residue from fluid extract of viburnum? *A.*—Yes, sir; I did.

Q.—That is viburnum prunifolium? *A.*—Yes, sir.

Q.—What is the residuum, do you remember? *A.*—As I recall it, the residuum from 100 cubic centimeters of Wine of Cardui is 25.8.

Mr. Walker:—The question was as to viburnum prunifolium. *A.*—Fluid extract of viburnum prunifolium. Pardon me.

Mr. Walker: Q.—What was the percentage? *A.*—25.8 as I remember it.

Mr. T. J. Scofield: Q.—Did you ever make an examination of carduus benedictus, fluid extract of carduus benedictus with the idea of determining the amount of residuum from that? *A.*—I have done so. The residuum—

Q.—With what result? *A.*—The residuum from 100 c.c. of carduus benedictus was about 18 per cent., 18 grams. May I explain, your Honor, what a gram is?

Q.—Yes, what is a gram? *A.*—A gram approximately is the equivalent of 15 drops of water; and throughout this case you will probably hear the term "grain" and a grain is approximately equivalent to one drop of water. That is not exact and in science we would not take that definition, but to carry it in mind, that would probably be as good as any way.

Q.—Now, Doctor Leech, have you present with you a bottle of McElree's Wine of Cardui? *A.*—I have not.

Q.—Well, have you present with you any of the synthetic preparations which you made? *A.*—I have.

Q.—Will you please produce that. (Witness produces a bottle containing a liquid.)

Mr. T. J. Scofield:—Mr. Reporter, will you mark that Defendants' Exhibit 28.

(Bottle marked as indicated.)

Q.—Now, Doctor, in working with McElree's Wine of Cardui, did you determine, make any effort to determine, or did you determine how much valerianic acid was contained in that preparation? *A.*—From two bottles of McElree's Wine of Cardui, I found there was 0.0181; 18.1 milligrams of valerianic acid.

Q.—Did you make a determination of the amount of valerianic acid that was in the synthetic preparation which you built up? *A.*—I did not.

Q.—Did you make any determination of the amount of valerianic acid in viburnum prunifolium? *A.*—I did. It might be put in these terms: .0431 grams of valerianic acid was obtained from 10 grams of viburnum prunifolium.

Q.—Did you determine how much, or ascertain in your work how much valerianic acid there is in a dose of Wine of Cardui? *A.*—In Wine of Cardui there is, according to my determination one milligram of valerianic acid or in terms of grams, .001 grams.

Q.—Do you know what the dose of viburnum, or the fluid extract of viburnum or viburnum prunifolium, is, according to the United States Pharmacopeia? *A.*—I do.

Q.—What is it, Doctor?

Mr. Walker objected to this question and the objection was sustained after discussion, but withdrawn by Mr. Walker. The witness then testified:

A.—According to the United States Pharmacopeia the dose is given as two grams.

Mr. T. J. Scofield: Q.—As how much?

Mr. Walker:—Did he say "drachms" or "grams"?

The Witness:—Grams.

Mr. T. J. Scofield: Q.—How much valerianic acid is there in a dose of fluid extract of viburnum prunifolium?

THE COURT:—In a dose of that size. *A.*—There is 8.6 milligrams of valerianic acid.

Mr. T. J. Scofield: *Q.*—Can you tell us what the fraction of valerianic acid contained in McElree's Wine of Cardui is, when compared with a dose of the fluid extract of viburnum as given in the pharmacopeia of the United States? *A.*—About 2/17ths of a dose in McElree's Wine of Cardui.

Q.—Doctor, is there any valerianic acid in carduus benedictus? *A.*—There is not.

Q.—Have you made and compared preparations of carduus benedictus and carduus marianus tinctures? *A.*—I have.

Q.—Have you got any such preparations with you? *A.*—I have.

Q.—Will you produce them? *A.*—(Producing two bottles containing liquid.) This is tincture of carduus benedictus, containing 20 per cent. alcohol and made by treating 20 grams of carduus benedictus with 200 c.c. of 20 per cent. alcohol. (The bottle last hereinabove identified by the witness is marked Defendant's Exhibit 29.)

This is a tincture of carduus marianus containing 20 per cent. alcohol made by treating 20 grams of the seed of carduus marianus with 200 c.c. of 20 per cent. alcohol.

(The bottle last hereinabove identified by the witness is marked Defendant's Exhibit 30.)

Q.—Now, in the preparation of carduus benedictus, that tincture, what part of the carduus benedictus did you use? *A.*—The stem, leaves and seed.

Q.—In the preparation of the tincture of carduus marianus, what part of that herb did you use? *A.*—The seed.

Q.—What did you say, Doctor? *A.*—The seed.

Q.—Have you at any time made an examination of carduus benedictus and carduus marianus for the purpose of determining whether or not they respectively contain cnicin? *A.*—I have examined them for the yellow amorphous substance, so-called cnicin. I found carduus benedictus, using the whole herb to give a yellow amorphous substance, such as is described here and which we may call cnicin. Upon treating the seeds of carduus marianus in the same manner, I did not obtain cnicin.

Mr. T. J. Scofield:—That is all.

CROSS-EXAMINATION BY MR. HOUGH

THE COURT:—One question before the cross examination. Did you experiment on yourself with any of your own products as you did with the Wine of Cardui? I mean, did you take any of it? *A.*—No, I did not.

Dr. Leech was then asked several questions concerning the difference between fluid extracts, tinctures and doses. He mentioned fluid extracts of carduus benedictus which had been prepared in the ASSOCIATION'S laboratory and of various fluid extracts of carduus benedictus which had been purchased in the open market.

Q.—Now, do you know whether any comparison was made between the other two other than the Parke-Davis preparation, with the preparation which was made by Dr. Warren? *A.*—I do not. I myself did not.

Q.—What was the percentage of alcohol in the Parke-Davis preparation? *A.*—If I remember correctly, it was 40 per cent.

Q.—40 per cent. of alcohol? *A.*—Yes, sir.

Q.—Would that make a difference in comparing it with the product that you made, containing only 20 per cent. of alcohol? *A.*—I do not believe the alcoholic content would. I do not believe the alcoholic content in the amount of the drug used, would. In other words, a great deal more of the drug is used in making the fluid extract of carduus benedictus than is used in making an extract such as Wine of Cardui from carduus benedictus.

Q.—Why? *A.*—That, I presume, could be answered better by the Wine of Cardui people.

Q.—Do you mean why they use less alcohol? *A.*—No, less drug.

Q.—I thought you said they used more alcohol than would be used by the Wine or Cardui people? *A.*—May I explain?

Q.—You can answer that first, and then explain. *A.*—Yes. There is more alcohol in the Parke-Davis preparation, but the Parke-Davis preparation contains twice as much alcohol as the alcohol contained in Wine of Cardui, contains a residue which is six times as great as the residue obtained from Wine of Cardui. In other words, the ratio between the alcohol is one to two, but the ratio between the amount of drug in the substances, if we were to measure it by the residue, is one to six.

Q.—Now, when you reduced, or if you should reduce the Parke-Davis fluid extract to a tincture, how much of the extractives would be in that and how much of or what would be the percentage of alcohol? *A.*—I am not qualified as a pharmacist, and I am not prepared to answer that.

Q.—Is it not a fact, and don't you know, that there would be more alcohol and less extractive? *A.*—I do not.

Q.—You do not know that as a chemist then? *A.*—I do not.

Q.—And you do not know it as an individual? *A.*—I do not.

Q.—Would you call Wine of Cardui a fluid extract or a tincture? *A.*—I should state that Wine of Cardui approached more nearly a tincture.

Q.—You say the dose of viburnum prunifolium, as given in the United States Pharmacopeia is two grams? *A.*—Yes, sir.

Q.—Do you mean of the fluid extract, or the tincture? *A.*—Since a fluid extract is the extractives from one gram for one c.c., and the dose is two c.c., that would be extractives from two grams of viburnum prunifolium.

Q.—Did you compare the alcohol and dosage of extractives of Wine of Cardui with cimicifuga, for instance? *A.*—I did not.

Q.—Did you compare it with any of the other pharmacopeial preparations? *A.*—I did not.

Q.—Now, what is the dosage of carduus benedictus in the eclectic pharmacopeia? *A.*—I am not qualified as a pharmacist and I cannot say.

THE COURT:—If you know, you may tell; if it is shown in this book. *A.*—I do not know, your Honor.

Mr. Hough:—Do you know whether it is more or less? *A.*—I do not know.

Q.—Not even as an individual? *A.*—I do not know.

Q.—What is the dosage of carduus benedictus in the homeopathic pharmacopeia? *A.*—I am familiar only with the United States Pharmacopeia, since it is the official pharmacopeia.

Q.—What is the dosage of adrenalin in the United States Pharmacopeia?

THE COURT:—What is the purpose of this, Mr. Hough?

Mr. Hough:—Why, he is trying, as I understand it your Honor, to make a point about the amount of extractives here and he has compared it with certain other preparations.

THE COURT:—And he referred as to the dose, to one single work.

Mr. Hough:—You mean the pharmacopeia?

THE COURT:—Yes.

Mr. Hough:—Well, I am confining this now to the pharmacopeia; that is the last question.

Q.—What is the dose of adrenalin in the U. S. Pharmacopeia, with which you say you are familiar?

Mr. T. J. Scofield:—That is objected to.

THE COURT:—Objection sustained.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough:—When did you buy, or did you buy the carduus benedictus in the crude drug form? *A.*—I did not. It was bought by the laboratory of the AMERICAN MEDICAL ASSOCIATION, and the drugs were verified before use.

Q.—You don't know where they bought it? *A.*—Definitely, no. I think some were bought in the east, and some here in Chicago.

Q.—You mean it was bought from a regular drug house? *A.*—I think some of it came through the channels of the drug houses.

Q.—How many drug houses in the country sell crude carduus benedictus? *A.*—I do not know.

Q.—Do you know what the amount of alcohol is in the fluid extract of viburnum prunifolium that you have testified to, as given in the pharmacopeia? *A.*—If I remember correctly, it was 55 per cent.

Q.—Why did you get, if you know, one color in one of these preparations and a different color in the other? (Referring to exhibits 29 and 30.) *A.*—I presume, *a priori* because I used different preparations to start with.

Mr. Walker:—(Referring to exhibits 29 and 30.) The red one is carduus benedictus and the light colored one is carduus marianus?

The Witness:—You are correct.

Mr. Hough:—*Q.*—Why did you get different colors? *A.*—Because I used different preparations to start with, different drugs.

Q.—Did you ever analyze or make a preparation of the seeds of carduus benedictus alone? *A.*—I did not.

Q.—Did you ever make an analysis of the herb of carduus marianus—not an analysis, but a preparation? *A.*—I was not able to obtain all of the herb carduus marianus.

Q.—Did you try to? *A.*—I did.

Q.—Did you make a report in writing as to your chemical analysis? *A.*—I made a typewritten report and signed my name to it, that is, I typewrite the report.

Q.—May we have that report? I will ask you first,—withdraw that last question. Is there any difference between the report as made by you, and the chemist's report as it was printed in the first article of the JOURNAL of the AMERICAN MEDICAL ASSOCIATION of April 11th, 1913? *A.*—In all essential particulars, my report confirms that report.

Q.—Now, do you mean to say that a chemist reading that report would be justified in stating that that preparation was made from certain herbs or drugs? *A.*—I think that a chemist who was guarded would not take another chemist's report without making experiments himself, a chemist who was careful and discriminating.

He was then asked concerning the principles which govern a chemist making conclusions from an analysis, the final question being:

Q.—I now hand you the chemist's report in THE JOURNAL'S article to which I referred, and ask if, from that chemical report, eliminating the conclusion, a chemist would be justified in stating what the drugs were in that mixture?

To which he answered:

A.—No, he would not be justified absolutely in stating what the drugs were in that mixture.

Mr. Hough:—Doctor, I neglected to ask you whether or not you found any volatile oils in examining carduus benedictus? *A.*—I found that, if there were any oils present, they were in such very minute quantities, as first, not to make any noticeable effect on the alcohol determination. In fact, when the alcohol was distilled over, there was a clear distillate. The volatile matter that I recovered and which I enumerated as four one thousandths of a per cent., contained no alkaloids.

Q.—You are positive that there was not the slightest turbidity? *A.*—I am positive of that. I saw one or two other alcohol determinations not made by myself, in which there was no turbidity. At times there may be turbidity, but it was so slight that in three cases that I recall, there was no turbidity. And further to substantiate the fact that the oils were not there in any appreciable amount, if the substance, after the specific gravity had been taken, was shaken with ligroin, which is used in the *Bulletin of the Official Agricultural Chemist*, this did not vitiate the original results.

Q.—You say it would not be possible for any other chemist to find in carduus benedictus any more of volatile oils than you found. *A.*—I did not.

Q.—Do you think it might be possible? *A.*—He might have different samples of carduus benedictus.

Q.—Or he might use a different process, might he not? *A.*—Certainly.

Q.—There are some processes of analysis which would not save the volatile oils, are there not? *A.*—It depends on what you mean by "process of analysis." If you mean a process of analysis for volatile oils, then if the processes are correct, in the end they must agree. If they are not correct, they do not agree in the end and one or the other is not correct.

Q.—And which would you say was not correct, yours or the other man's? *A.*—I would have to see what the other man did, and see what his results were.

Q.—Before you would determine whether your own was correct or not? *A.*—In this instance, after I had determined it, I sent my method to one of the best known oil chemists in the United States, and he—Professor Kramer.

Q.—Never mind that. *A.*—I thought you were after the facts in the case.

Q.—Professor Kramer is here to testify? *A.*—I have never seen Professor Kramer and I would not know him if he were in the room.

THE COURT:—You need not go into that. Counsel stopped you, and you need not go into it.

Mr. Hough: *Q.*—What did you do with the cnicin which you secured by your analysis. *A.*—I secured a yellow amorphous substance, sometimes called cnicin.

Q.—You don't know whether it was cnicin or not? *A.*—It was of little importance to me whether it was cnicin or not.

Q.—Why was it of little importance to you, as a chemist? *A.*—Because I was able to get the same substance, which responded to exactly the same reactions, from Wine of Cardui, from carduus benedictus and from my synthetic preparation. They gave identically the same reactions and consequently that sufficed for the purpose for which I was working.

Q.—But you started to discover cnicin, didn't you? *A.*—Oh, no, not at all.

Q.—Don't you have to hunt for some particular thing in that process, and does not that determine the process which you use? *A.*—When there is a particular thing there which is well known, and which has received careful chemical collaboration, all right. But in the case of carduus benedictus, there has been so little work done on it—evidently not considered important—that I did not consider that I should call this cnicin, unless I made an extensive study of it.

Q.—Have you read any process for the determination of cnicin in any drug? *A.*—In a general way, yes.

Q.—Who has written on the subject? *A.*—The same authorities that were enumerated yesterday morning. Swantner, Schreiver, and I think Nativelle.

Questions were then asked concerning the process used for the determination of cnicin and concerning its properties.

TESTIMONY OF DR. CLARK

Dr. Albert Henry Clark was called as a witness on behalf of the defendant.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Albert Henry Clark testified that he is head of the department of chemistry of the University of Illinois, School of Pharmacy. He has been a chemist for about twelve years. He is a graduate of the University of Illinois, School of Pharmacy, University of Michigan, in which institution, he obtained the Bachelor of Science degree in Pharmacy. He had been for twenty years engaged in retail drug business being a registered pharmacist in Illinois. He testified:

Q.—Doctor, have you made any analysis of McElree's Wine of Cardui, manufactured by the Chattanooga Medicine Company? *A.*—I have.

Q.—Will you state briefly now and in a general way what results you obtained from the analysis which you made? *A.*—Well, first of all, I examined it for volatile matter by steam distillation, distilling it in steam, trying to get anything that would distill over. I distilled it in a vacuum, collecting the distillate and so forth, at a low temperature, so that no volatile matter could escape. In all of these experiments I failed to find any appreciable quantity of volatile matter. The distillates were perfectly clear, did not contain any oil or anything of the kind and, on extraction of the distillates, the various solvents I could not get anything out of the distillates; just a minute trace of something that had a sort of a valerian-like smell.

Q.—Now, Doctor, just there a moment. You say the distillate was clear? *A.*—They were not opalescent.

Q.—What does that indicate, so far as volatile oils are concerned? *A.*—The absence of volatile oil and things of that character.

Q.—How were those distillates carried over, in what way? *A.*—In various ways. I distilled it directly, just by boiling the stuff, and passing the vapors through a condenser with cold water around it so as to condense those vapors just as you would condense steam. I also distilled it by passing live steam through it, which will carry over those things which would perhaps not distill over directly. I also distilled it by connecting it with a vacuum pump so that it could be distilled at low temperature.

Q.—At what temperatures? You say "low temperatures." *A.*—Well, as compared with ordinary room temperatures which ranges around 70 or 75 degrees Fahrenheit. This was about half that. Temperature much lower.

Q.—Now, continue with your statement as to what you found as a result of your analysis? *A.*—I found nothing of any—no appreciable amount of volatile matter under those circumstances. Then I determined all these distillates—or not the distillate, but the preparation in the same way, by distilling directly the amount of alcohol and I found 20 per cent. of alcohol, or approximately 20 per cent.

Q.—Speak louder. *A.*—I found 20 per cent. of alcohol or approximately 20 per cent. Then I evaporated off the alcohol and water that it contained and obtained a residue of about 3 per cent. I examined this residue for mineral matter, minerals such as copper and iron and things of that kind. I found just small amounts of them such as have been mentioned before, practically the same as the others have found. I also examined it—that examination would exclude—

Q.—Pardon me for interrupting you. You said you found small amounts of such things as have been mentioned before. *A.*—Calcium and sodium and potassium.

Q.—What do you mean by having been mentioned before? *A.*—The other witnesses have mentioned them.

THE COURT:—Have you been here all the time during this trial? *A.*—Yes, sir. Calcium, sodium, potassium and iron and such things.

Mr. T. J. Scofield: *Q.*—Go ahead. *A.*—I examined it also for alkaloids, such as you would find in many plants, quinin and things of that kind, and found none there at all. That would exclude a couple of hundred of drugs that are generally considered potent drugs, that is drugs that are powerful drugs I should say, drugs that have specific action. I examined it for metallic substances, copper and arsenic and things of that kind and found none of those present at all. None of those drugs were present. I examined it for emodin bearing drugs, such as senna—carthartic drugs—senna and rhubarb and things of that kind. There was none of those present. I found caramel—

Q.—What do you mean by caramel? *A.*—Coloring matter, burnt sugar, coloring matter; I found that present. I found minute traces of tannin; I found a very small amount of resin, very small. That is practically the chemical examination. I found on an extraction with acid—I should say with ether—I found the same amorphous, yellow bitter substances that others have found, which has been called cnicin.

Q.—When you say that others have found, you refer to the chemists who have preceded you on the stand? *A.*—Yes, sir. Perhaps I should not use that word, but it was just to shorten up the matter and I mean the others who have testified here.

Mr. Walker:—It would be easier and just as well for him to tell what he found.

THE COURT:—It would be very much easier.

Mr. Walker:—Never mind the others.

The Witness:—I found on extraction with ether, a yellow, bitter, amorphous substance, a noncrystallizable substance. Amorphous means that it will not crystallize and that had the characteristics mentioned. It gave color reactions with sulphuric acid and hydrochloric acid that are attributed to this substance called cnicin.

Mr. T. J. Scofield: *Q.*—Did that constitute the result of your examination? *A.*—I believe so.

Q.—Did you make a note of the amount of water that was contained? *A.*—I did not, not particularly.

Q.—Now, tell me whether or not, you having torn Wine of Cardui down, you undertook to build it up, or to make a synthetic preparation? *A.*—I made a synthetic preparation from carduus benedictus and from viburnum.

Q.—How many of those preparations did you make? *A.*—I made just one, one containing those two drugs.

Q.—When you say viburnum, do you mean— *A.*—Viburnum prunifolium and carduus benedictus. By extraction with 20 per cent. alcohol and adding to the percolate and the extracted liquid, caramel coloring and carbonate of soda.

Q.—Will you state the quantity of viburnum prunifolium and carduus benedictus that you used? *A.*—I used the two drugs in the proportion of 10 per cent. of viburnum to 90 per cent. of the other.

Q.—You mean viburnum prunifolium? *A.*—Viburnum prunifolium.

Mr. Walker: *Q.*—The viburnum prunifolium was 10 per cent.? *A.*—10 per cent. of viburnum, yes, sir; with 90 per cent. of the other and the two combined, 64 grains of pure fluid.

Mr. Scofield: *Q.*—How many? *A.*—64 grains, approximately that. 64 grains per fluid ounce.

Q.—About how much viburnum prunifolium does that make to the fluid ounce? *A.*—Per fluid ounce, that would make about 10 per cent. of 64 grains and that would be approximately 6 grains to the fluid ounce, 6 and a half grains.

Q.—Go ahead, now, Doctor. *A.*—That preparation I examined carefully as to the residue on evaporation of the alcohol and things of that kind; the alkaloids—and in every respect it corresponded to Wine of Cardui itself. It contained the same bitter principle, or bitter substance, yellow, amorphous bitter substance that Wine of Cardui did. It responded to the same reactions and so forth. It gave the same weight—not exactly the same weight, but about the same weight of residue and the same weight of ash and things of that kind as Wine of Cardui. It has the same valerian-like odor and the same bitter taste. That preparation here—after making the analysis, this is what I had left of it. (Exhibiting bottle.)

Mr. Hough:—Which analysis do you mean? *A.*—After making the analysis I just mentioned.

Mr. Walker:—That is the synthetic composition? *A.*—I made of the synthetic.

Mr. T. J. Scofield:—And then, it was analyzed and this is what you have left in the bottle? *A.*—This is what I have left.

THE COURT:—There does not seem to be enough to go around, gentlemen.

Mr. T. J. Scofield:—That is true, there is not enough to go around. (Counsel for respective parties examine the contents of the bottle identified by the witness.) That is not bad.

Mr. Hough:—I have not got the same kind of a stomach that the Judge has.

Mr. Walker:—That looks like the right color, but there is too little of it.

The Witness:—That preparation is a trifle lighter than the other, because I put in caramel and the caramel property was not as dark caramel as the others.

Mr. Hough:—My stomach is not as strong as yours, Judge.

Mr. T. J. Scofield:—My stomach is all right, and I could take the whole bottle.

The Witness:—It is perfectly harmless. I took five ounces of it myself.

The Court:—(Addressing the Reporter) Did you get Mr. Walker's frown and Mr. Scofield's smile?

Mr. Walker:—I would like to have Mr. Scofield take Wine of Cardui and keep his smile.

Mr. Scofield:—I will do it. I offer this now in evidence and ask that it be marked Defendant's Exhibit 31.

(Bottle marked as indicated.)

Q.—What else have you there in the way of synthetic preparations, if anything? *A.*—From Wine of Cardui, itself, I evaporated off the alcohol and then added water to it in order to make it up to the original volume to see if the alcohol — to show that the alcohol itself had no especial solvent effect upon the material there. That is a sample with the alcohol removed and the water added to it, and here (producing another bottle) is a sample of the genuine, of the real Wine of Cardui in the same sized bottle, for comparison. Boiling off the water—boiling off the alcohol I mean, and then adding water to it again, making up the original volume, does not precipitate out any material whatever.

Mr. T. J. Scofield:—I ask that this bottle be marked Defendant's Exhibit 32, which the witness says contains water instead of alcohol.

Mr. Walker:—Now, what are you going to do with the other. He gave you one with the alcohol in it.

The Witness:—One is Wine of Cardui, just as I took it from the bottle and the other is the one minus the alcohol but with the water added.

Mr. T. J. Scofield:—Mark the bottle I now hand you as Defendant's Exhibit 33, being the bottle of the Wine of Cardui which the witness says—no, being the Wine of Cardui which the witness says he took from the bottle.

(Bottle marked as indicated.)

The witness also produced a preparation, a specimen of Wine of Cardui, and from which the alcohol had been evaporated, 30 per cent. by volume of glycerin added to make up the original volume, also the bottle containing the alcohol, which had been evaporated off. He also produced a specimen made from carduus benedictus and viburnum prunifolium by percolation extraction with a liquid 40 per cent. glycerin and 60 per cent. water, also a sample of the Wine of Cardui which had been evaporated to a thick syrupy consistency with alcohol added and water to make up the original volume; also tablets prepared from Wine of Cardui after evaporating off water and alcohol and tablets made from the synthetic preparation of carduus benedictus and viburnum prunifolium. He also produced pills made from the extractives of Wine of Cardui and pills made from the synthetic preparation.

Mr. Hough for plaintiff, said:

"I wish to make an objection to all these exhibits on the ground that they are incompetent, irrelevant and immaterial to any issues in this case.

The Court:—At this time the objection will be overruled.

To which ruling of the court the plaintiffs, etc., excepted.

Mr. Hough:—I just want to get it on the record.

The witness then produced the residue from Wine of Cardui put into capsules and the residue from the synthetic preparation put into capsules. He also produced a mixture of carduus benedictus 90 per cent. and viburnum prunifolium 5 per cent.; also a preparation made from carduus benedictus and viburnum prunifolium by extraction with 20 per cent. alcohol, the same strength of alcohol as is in Wine of Cardui and containing twice as much extractive matter,

"showing that the proportion Wine of Cardui could be put up in—or it could be extracted and retain the constituents of those two drugs in a proportion twice as great as Wine of Cardui really does, and then given in the same dosage, the amount of alcohol would be just one half of what it is in Wine of Cardui."

He also produced a preparation made the same as the first one exhibited, from carduus benedictus but without any viburnum.

To all these exhibitions, Mr. Hough for the plaintiff, offered objections, all of which the court overruled and to each of which exception was taken.

Mr. Walker for the plaintiff then said:

Mr. Walker:—Now I want to ask your Honor to exclude and strike from the record the exhibits offered by this witness.

The Court:—The motion will be denied.

To which ruling of the court the plaintiffs, etc., excepted.

The further hearing of the case was adjourned to 2 o'clock of the same day.

March 30, Afternoon

The court met pursuant to recess. Dr. Albert H. Clark resumed the stand for further direct examination by Mr. T. J. Scofield. After objection which was overruled, he testified that he took four tablespoonsful at a single dose of Wine of Cardui. The taste was rather bitter but not unpleasantly bitter. A little while after he had taken it, he felt a sort of a warmth in the stomach and a glowing sensation in the face, which became flushed. The next day, he took the same quantity of 20 per cent. alcohol; he also took synthetic preparations minus the alcohol and perceived no effect. To all of these questions objection was made.

Mr. Scofield then asked:

Mr. T. J. Scofield:—Now, Doctor, referring to this exhibit which you made without the use of alcohol and did make with glycerin, do you know whether or not that preparation will keep? *A.*—Those preparations—one of them is almost three weeks old. The other one is almost two weeks old. They have stood for that length of time. In addition to that they were both placed in an incubator at a temperature of about 98 degrees, that is ordinary body temperature, such temperature as there is on a rather hot day, which is especially favorable toward the development of fermentation, and things of that kind. They were kept at that temperature for three days, and there are no signs of fermentation or spoiling, in the ordinary sense of the word at all, so they will certainly keep under those conditions. I might add that the other preparations, aside from those glycerin preparations—well, they are between two and three weeks old, and they are all keeping. They have not fermented or spoiled in any sense of the word.

Q.—Now referring, Doctor, to the tablets which you have here and the pills, and the preparations which are contained in capsules: Will they keep or not? *A.*—They have kept, as I say, for three weeks, nearly three weeks. No signs of spoiling that I can see at all.

The witness then testified that he had been engaged for eighteen years in the retail drug business in Illinois and for eleven years in a drug store which filled on an average of 15,000 prescriptions a year; that he had filled 10 to 15,000 prescriptions during that eleven years. He was asked as to whether he had ever been presented with a prescription calling for carduus benedictus as an element. Objection was made and sustained, and the answer sticken out on motion.

CROSS-EXAMINATION BY MR. HOUGH

On cross-examination the witness stated that menstruums and preservatives which he had mentioned other than alcohol are as good in this particular instance as alcohol itself. He testified that he had seen one fluid extract prepared by a pharmaceutical house—Parke, Davis & Company. He was asked as to whether he had any connection with the American Medical Association and as to whether he had approached the examination without prejudice. He answered that he had no connection with the American Medical Association and approached the question absolutely without any prejudice.

He was then asked:

Q.—How long would you say the samples which do not contain alcohol would keep? You have stated how long they have kept already. *A.*—Yes.

Q.—How long would you say they would keep before they would commence to deteriorate or precipitate? *A.*—Well, I have some without any glycerin. Do you mean those with glycerin or those without?

Q.—All those without alcohol. If there is a difference in the time that each would keep, just explain. *A.*—Oh, there is a difference in the time. I have a preparation there without any alcohol at all in which I evaporated it off and put in water. Do you mean that one, or the glycerin?

Q.—Well, take each one that hasn't any alcohol in it. *A.*—Well, that aqueous solution, the one in which I evaporated off the alcohol, I

simply made up the volume with water, nothing else; that probably would not keep. The ones that have glycerin in as a menstrum would keep indefinitely. The pills and the tablets would keep indefinitely.

THE COURT: *Q.*—When you say the one with the water would not keep, you have already had it two weeks, haven't you? *A.*—No, that one has not been made that long, that solution.

THE COURT:—Then that ought to be so stated.

Mr. Walker:—That was not included in the others.

THE COURT:—What?

Mr. Walker:—That was not included in the others.

THE COURT:—Oh, I thought it was.

Mr. Walker:—No.

The Witness:—I knew that would not keep, therefore, I just made that day before yesterday. That one will not keep, the one with water alone; there is no question about that. That will not keep. It is all right now, it has kept 48 hours, and it is all right now. But those with glycerin will keep indefinitely, and the pills and the tablets will keep indefinitely.

Mr. Hough: *Q.*—Now is there anything in glycerin which will destroy bacteria in the atmosphere? *A.*—I am not a bacteriologist. I don't know.

Q.—You don't know anything about that? *A.*—No, sir.

Q.—You don't know anything about the advantage of the use of alcohol in drugs from that point alone? *A.*—No, sir; not from the point of bacteriology; no, sir.

The witness was asked concerning the preparation of his synthetic specimen as to the taste, etc.

He was then asked:

Mr. Hough: *Q.*—In the manufacture of the tablet it necessarily would not contain anything of a volatile nature, would it? *A.*—There is nothing—there is only the minutest trace of volatile matter in Wine of Cardui, and of course that would disappear in the manufacture of those tablets.

Q.—Anything which was of a volatile nature would have disappeared? *A.*—Would have disappeared, but my analysis shows that there is no volatile matter in Wine of Cardui.

Mr. Hough:—I know what you want to say, and you have said it two or three times. Now if you will listen to me, and reply to my questions we will get along better. *A.*—That is right. If there were volatile matter there it would have disappeared.

Q.—What test did you make to determine the amount of volatile matter? *A.*—I did not determine the amount of volatile matter. I tried to. I tried repeatedly to determine it, and the quantity was so small, that I could not do it, I thought, in a satisfactory manner.

Q.—What method did you use to determine whether there was any volatile matter there at all? *A.*—I distilled it directly. Just simply put it in a flask and distilled it over, and condensed the distillate. I passed steam through it, what we call a steam distillation, drove the volatile matter over by steam and collected the distillate in that way. I distilled it under a vacuum, pumped out the air so that it would distill it at a low temperature, and all that kind of a thing, and distilled it over, and in every case when I would extract the distillate with ether and chloroform and solvents like that to get out any possible volatile oils and matters of that kind. I couldn't find any.

Q.—No discoloration at all? *A.*—No discoloration at all.

Q.—And not turbid? *A.*—Not turbid; no, sir.

Q.—Do you know of other processes than the one that you used for determining volatile matter in any substance? *A.*—I do not; no, sir. Those were the standard methods, and the best that I knew of.

Q.—Do you know anything about the literature of carduus benedictus? *A.*—I know the literature in a general way.

Q.—Do you know that it is stated that there is a volatile principle in it? *A.*—I do not recall that; no, sir. That may be so; but I do not recall it. If there is a volatile constituent in carduus benedictus in any considerable quantity, it is not there in Wine of Cardui.

Q.—What is that? *A.*—I say if there is a volatile constituent in carduus benedictus, the drug itself, that volatile constituent is not in Wine of Cardui to any considerable extent.

Q.—You mean unless your process failed to discover it? *A.*—Yes, but that was a standard process, and I would certainly get it.

Questions were then asked as to the process of distillation. The witness was then asked:

Q.—Did you say that glycerin would assist or retard the absorption of a drug, or have any effect? *A.*—I said I didn't know anything about it.

Q.—Oh, you don't know anything about it? *A.*—No, I don't know anything about it.

Q.—Why is alcohol used in witch-hazel? *A.*—I don't know.

Q.—You don't know? *A.*—No.

Q.—You only know it is? *A.*—There is some alcohol in it; yes, I think.

Q.—Do you know why alcohol is used in listerin? *A.*—No.

Q.—It is used, isn't it? *A.*—I don't know anything about it.

Q.—You never saw listerin? *A.*—Oh, I have seen it, yes.

Q.—And yet you don't know whether it has alcohol in it? *A.*—I suppose now-a-days it says so on the label, but a few years ago, I know when I sold it a great deal it did not say anything about it. I don't know whether it had or not.

Q.—And you mean to say that although you sold it right along, you don't know whether it had any alcohol in it? *A.*—I don't know whether it had anything else. Nobody knew.

Q.—Is extract of witch-hazel entered officially in the pharmacopeia? *A.*—Yes, sir.

Q.—And that requires that it have alcohol, doesn't it? *A.*—In speaking of "extract of witch-hazel" what do you mean? Fluid extract?

Q.—Well, what do you understand by the term? *A.*—Fluid extract of witch-hazel.

Q.—As named in the pharmacopeia? *A.*—Well, I wouldn't say positively whether fluid extract of witch-hazel is in the pharmacopeia or not. If you mean the—

Q.—Now, did you say you got cnicin? *A.*—No, I said that I got a yellowish amorphous, bitter substance that was similar in its reactions, etc., to the material that is described in the literature as cnicin.

Q.—But you did not determine for yourself, whether it was or was not cnicin? *A.*—Beyond the fact that it gave those reactions which are ascribed to the substance called cnicin.

Q.—And you found some tannin? *A.*—Minute traces of tannin.

Q.—And you found some resin? *A.*—Minute quantities of resin.

Q.—And you say that all of those, including resins, are freely soluble in water? *A.*—No, sir; I didn't say that.

Q.—You didn't say that? *A.*—I didn't say that; no, sir.

Q.—Well, what did you say? *A.*—I don't know whether I did—

Q.—They were in the residue, weren't they? *A.*—They were in the residue, yes.

Q.—And you said the entire residue was freely soluble in water? *A.*—I said that the residue when taken up with water was just the same as the original, and I have a sample over there which you can examine, and see that for yourself.

Q.—What was the reaction for this amorphous substance you referred to which you think might be cnicin? *A.*—Cnicin—it was slightly acid in reaction; in the specimen I had it was slightly acid, I believe.

The witness testified as to the taste and reaction of cnicin. He was asked:

Q.—You say you have compounded as many as 15,000 prescriptions? *A.*—Yes, I think so.

Q.—What proportion of them contained alcohol, would you say?

Mr. T. J. Scofield:—I object to that question, if the Court please.

THE COURT:—Objection sustained.

To which ruling of the Court the plaintiffs, etc., excepted.

Mr. Hough: *Q.*—Did any of them contain alcohol?

Mr. T. J. Scofield:—I object to that question.

THE COURT:—Is this for the purpose of testing his qualifications as a chemist? That question was one of the preliminary questions to qualify the witness. It was not objected to. I don't see that it would have any part in this case except to qualify him as a pharmacist and as a chemist.

Mr. Hough:—But he has gone into the question of other substances, better, I think is the impression that he means to create on the jury, than alcohol.

The Witness:—No.

Mr. Hough:—Now, if, in all his prescriptions and compounds they used alcohol—

THE COURT:—Now let me ask one question. When you speak of prescriptions, were those documents brought to you from doctors, which you had to fill, as stated?

The Witness:—Yes, sir.

THE COURT:—Objection sustained.

To which ruling of the Court the plaintiffs, etc., excepted.

The witness was then asked to identify reports of articles in the literature, Schreiver's and Swantner's work and to read from the literature. Objection was made and sustained, the Court ruling that such evidence may be introduced later by the plaintiff.

TESTIMONY OF DR. ALVISO B. STEVENS

Dr. Alviso B. Stevens was called as a witness on behalf of the defendants.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Alviso B. Stevens testified that he is a teacher of pharmacy and chemistry in the University of Michigan, College of Pharmacy; he has been a chemist and pharmacist since 1875. He has made three complete analyses of McElree's Wine of Cardui obtained in the original sealed package. He testified as to the contents as did the previous witnesses. He took first a single dose, then a double dose and finally two ounces of the Wine of Cardui which had a decided effect—some slight dizziness—the same effect being obtained by taking alcohol and water in proportion of 20 per cent. The witness also took the contents of one bottle of

Wine of Cardui minus the alcohol from two-thirds of it and testified that it had the same effect as he had from the alcohol. He also prepared a synthetic mixture. He was asked:

Q.—What was the formula from which you made the synthetic preparation which you say corresponds to McElree's Wine of Cardui, do you remember? *A.*—I think I do. I think it was 142 grams, about—well, I have it right here in my pocket, if you will allow me to read from it; 142.6 grams of carduus whole, 15.75 grams of viburnum prunifolium; alcohol 241.8 cubic centimeters, and water sufficient to make of the final product 1,135.5 cubic centimeters. To this — do you want the full formula?

Q.—When you say carduus there, what do you mean, carduus benedictus, or what? *A.*—Carduus benedictus.

The witness also made synthetic preparations with glycerin and capsules, tablets and pills. These preparations were offered in evidence as defendant's exhibits.

He was finally asked:

Q.—Now, Dr. Stevens, what have you to say about the keeping qualities of these preparations which you have made without alcohol and in the condition of pills and capsules? *A.*—Oh, they would keep any length of time.

CROSS-EXAMINATION BY MR. HOUGH

The witness was asked as to the properties of cnicin and as to the disintegration and decomposition of tablets. He was then asked:

Q.—And do you mean to say that from the analysis alone which you first made, and without reference to the name which was on the bottle, you could have stated the material, herbs or minerals or substances, whatever you choose to call them, from which the medicine was made? *A.*—Not without comparison, no.

Q.—Comparison with what? *A.*—With other — with other herbs and plants and so on.

Q.—Well, how would you know what other herbs and plants to get? *A.*—By first getting the taste of it; if we find it is bitter, naturally we would compare that with the bitter herbs or bitter plants. Then we would see if there is a bitter alkaloid, and if there is no bitter alkaloid in there, there would be no earthly use examining for quinin, strychnin and drugs of that character.

Q.—In a chemical test, it is very frequently the habit to use the — or practice the organoleptic taste first, is it not? *A.*—My practice has always been, when I get a substance of that kind, to taste, smell, etc., first; using the senses to get some idea.

Q.—What? *A.*—Simply to get some idea.

Q.—And, when you taste that and it tastes bitter, you immediately classify it among the bitters? *A.*—Exactly.

Q.—And that excludes a large number of substances which would not be classed among the bitters? *A.*—Well, not necessarily, because they might be there in addition to that.

Q.—In addition to that? *A.*—In addition to the bitter.

Q.—How do you determine—

Mr. T. J. Scofield:—Doctor, if you will kindly talk louder —

The Witness:—Yes. Was the last remark understood?

Mr. Hough: *Q.*—What is a stomachic, do you know? *A.*—Well, it is a medicine that more or less acts — medicines that act directly on the stomach. I want you to understand distinctly that I am not testifying — I do not qualify as a physician; I don't pretend to go into the medical terms at all.

Q.—Well, are all bitters classed as stomachics? *A.*—No doubt they have some such action, but they certainly are not all confined to that, by any means.

Q.—About how many bitters, do you know of? *A.*—I could not tell you now.

Q.—Well, of course, in analyzing a thing, which from test indicates that it is a bitter, you must know of all the bitters, in order to determine which it is? *A.*—You need not necessarily have to know of them all. We know a good many, of course; but you don't retain all those tastes. We take and compare each with the others. We take another drug, that has a bitter taste, and we taste that, and then compare the taste we get. Now, if it is not like the bitter of quinin, you can tell it in a moment, and it is not like the bitter of strychnin — if you have tasted those — and if you have not, then you can compare the two and you can tell the difference; and although you do not know just which it is, still you recognize that there is a difference.

Q.—And by a process of elimination you reach a conclusion as to at least one ingredient; do you? *A.*—Yes.

Q.—Now, when there are bitters in a composition which contains a mineral, at what stage of the investigation do you determine the division? *A.*—We first attempt to separate — first separate the organic matter from the inorganic matters as far as possible; if it is in the earliest stages, before we have changed it, we take and get out that bitter principle by the action of certain solvents. If it is alkaloids we use certain methods of manipulation in which we shake it out with various solvents, solvents that do not mix with water, under certain conditions. Shall I go into a detailed statement of the assay of these preparations at all?

Q.—No; that is enough, unless you want to explain your answer. *A.*—No — all right; not at all.

Questions were also asked and answered as the possibility of determining the contents of such preparations without previous knowledge as to what ingredients to search for.

TESTIMONY OF DR. LEWIS E. WARREN

Dr. Lewis E. Warren was called as a witness on behalf of the defendants.

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Lewis E. Warren testified that he has lived in Chicago for nearly seven years, engaged in pharmaceutic and analytic chemistry. He is a graduate of the University of Michigan, Department of Pharmacy, with a degree of Bachelor of Science in Pharmacy, and with a degree of Pharmaceutical Chemist. He is engaged in the laboratory of the American Medical Association, and was employed for two years in the laboratory of Merck & Company, New York City. He also was Food and Drug Investigating Chemist in the Bureau of Chemistry at Washington for nearly two years. He has worked in the laboratory of the American Medical Association for almost seven years.

He testified as to the days on which he received various samples of Wine of Cardui, and the condition of such samples when received. Different samples contained 9 and 10 ounces, respectively. As to the consistency found, his analysis agreed essentially with those of other chemists who have testified. Concerning four different specimens examined, evidently compounded at different times, he testified:

Q.—Did you find any difference between the last analysis and your third or your second or your first, and if so, what was the difference, if any? *A.*—Only in the percentage of alcohol. As I said before, the second specimen did not have the valerian-like odor which the first and the third had, and the fourth had it also. The percentage of alcohol was slightly different from the second analysis, but not from the first or the third. The amount, I think, was 19.58 or somewhere along there, about 19.8, somewhere along there. There was no practical difference between the first specimen, the third specimen and the fourth specimen that I examined, that is, no essential difference. The products varied up and down in solid residue, a little bit in the alcohol, just two or three or four or five tenths of a per cent., something like that, but no essential difference.

The various specimens were offered in evidence as defendant's exhibits.

Further hearing of the cause was then adjourned until March 31, 1916.

March 31, Morning

TESTIMONY OF MR. LEWIS E. WARREN (CONTINUED)

Mr. Lewis E. Warren resumed the stand as a witness on behalf of the defendants.

FURTHER DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Mr. Warren was asked concerning the sensations which he felt after swallowing five doses of Wine of Cardui at one time. Objection was made and exception taken as with other witnesses. The witness experienced the same sensations as other witnesses. He was then asked:

Mr. T. J. Scofield: *Q.*—Have you ever made any examination of the fluid extract of viburnum prunifolium for the purpose of determining how much resinous matter a dose of viburnum prunifolium contains, the fluid extract? *A.*—Yes, sir.

Q.—How much is a dose of the fluid extract of viburnum prunifolium? *A.*—The pharmacopeial dose is two cubic centimeters, which is about 30 grains, 30 drops.

Q.—How much resinous matter did you find in a dose of the fluid extract in such a dose of fluid extract of viburnum prunifolium? *A.*—I made my determination on ten doses and found 795 milligrams on the ten doses, which would be about 79 milligrams on a test of one dose.

Q.—Did you ever make an examination of McElree's Wine of Cardui for the purpose of determining the amount of resinous matter in a dose of that preparation? *A.*—Yes.

Q.—What was the result of that examination? *A.*—I also used, in this case, ten doses of McElree's Wine of Cardui and used the same method for the determination of resins that I used when I determined the resins in the fluid extract of viburnum prunifolium and I got about 11 milligrams of residue out of 20 doses—I should say ten doses, I used ten doses—out of the ten doses I got 11 milligrams of residue. I do not know that that residue was resin but I got it by the method by which resins are determined. Had there been resins there, they would have come out in this particular fraction and that would be about one milligram per dose of Wine of Cardui.

Q.—Did you preserve the resins that you got from those two preparations? *A.*—I did.

The witness produced the resins which were introduced as a defendant exhibit. The witness also produced as exhibits resins of fluid extract from black-haw, and also introduced as defendant's exhibit the resins from fluid extract of viburnum prunifolium. The witness was then asked concerning the possibility of making tablets of those preparations

in the Pharmacopeia which contain alcohol. The attorneys for the plaintiff stated:

Mr. Hough:—I don't deny that they can make them. They can make tablets out of bread, or make bread pills, but the only thing I want to prove is the statement that they can do the same thing with every other pharmacopeial preparation, which the law requires to contain alcohol.

THE COURT:—That leaves up the question,—

Mr. Hough:—The fact that he actually did it, we don't question.

THE COURT:—That leaves open the question of whether you are preparing a fluid extract of something like this.

Mr. Hough:—Our medicine is a tincture.

Mr. T. J. Scofield: Q.—Mr. Warren, taking the fact—or taking the dosage of different medicines as given in the United States Pharmacopeia, to be correct, I will ask you if you know how many of the pharmacopeial preparations intended for internal use, contain alcohol? A.—Yes, sir.

Q.—How many? A.—That is, I have counted over the preparations which are intended for internal use and for which a dose is given, and I find 190.

Q.—Can you tell us what the range in percentage of alcohol in the 190 was? A.—Yes, it ranged from five tenths of one per cent. by volume to about 90 per cent. by volume.

Q.—Now, can you say how many of these different preparations contain the same quantity of alcohol to the dose as is contained in a dose of Wine of Cardui? A.—Yes, sir.

Q.—How many? A.—Two.

Q.—Can you name those two? A.—Yes, sir.

Q.—What are they? A.—Tincture of guaiac and taraxacum.

Q.—Do you know how many of those preparations, according to the United States Pharmacopeia, contain more alcohol in each dose than is contained in a dose of Wine of Cardui? A.—Yes, I have tabulated those.

Q.—How many? A.—Seven.

Q.—Can you name them? A.—I think so.

Q.—Well, name them. A.—There is the tincture of cimicifuga, spirit of anise (which is practically a flavoring preparation), spirit of juniper compound, tincture of nut galls, tincture of opium camphorated, which is paregoric; coca—Wine of Coca—and one that I do not recall.

Q.—You say there is one which you do not recall. A.—I enumerated—

Q.—Six. A.—Yes, there is one other that I do not recall at the present time, although I have it in my tabulation.

Q.—May I suggest, do you know whether or not tincture of sweet orange peel contains more alcohol than is contained in a dose of Wine of Cardui? A.—Yes, sir; that is the one that I omitted to mention. That is practically a flavoring preparation.

Q.—And those constitute the seven. Referring now to the dosage as announced in the Formulary, the National Formulary, can you tell how many of the preparations in the National Formulary which contain more alcohol, can you state how many of them by the dose contain more alcohol than Wine of Cardui? A.—That is, than in a dose of Wine of Cardui?

Q.—Yes, than in a dose of Wine of Cardui. A.—Yes, I made such a tabulation or count.

Q.—What is the fact about it? A.—I found about 203.

Q.—That contained what? A.—I found about 203 preparations in the National Formulary, as I remember it, about 203 that contain in each dose more alcohol—I beg your pardon, will you read the question again.

(The question was then read.)

A.—I misunderstood the question. Yes, there are about five of the 203 preparations in the National Formulary that contain alcohol.

Q.—Can you name the five? A.—Yes, tincture of coto, tincture of viburnum compound, spirit or elixir of potassium acetate, elixir of potassium acetate and juniper and elixir of curacao.

Q.—Do you know how the fluid extract of butternut compares? A.—The fluid extract of butternut is also, as I remember it.

CROSS-EXAMINATION BY MR. HOUGH

On cross-examination the witness testified that a considerable proportion of the 203 preparations named in the National Formulary have a higher percentage of alcohol than Wine of Cardui. He also testified that the resins found in viburnum prunifolium would be soluble as a minimum in from 50 to 52 per cent. of alcohol. Questions were asked concerning the alcohol in various pharmacopeial preparations:

Q.—Now, of the 190 pharmacopeial preparations in the—well, I said "pharmacopeial preparations,"—which contain alcohol, how many of them contain a larger percentage of alcohol than is in Wine of Cardui? Meaning larger than 20 per cent. A.—I do not know exactly, but a considerable proportion.

Q.—A considerable proportion. A.—Yes, sir.

Q.—More than one half? A.—I would probably think so; yes, sir.

Q.—Now, did you ever drink any of them to see how much you could drink before you got intoxicated? A.—No, sir.

Q.—When did you commence to drink Wine of Cardui?

Mr. T. J. Scofield:—I object to that question, if the Court please.

THE COURT:—When did you first experiment with it on yourself? A.—Well, about June, 1914.

Mr. Hough: Q.—When was the last time you experimented on yourself by drinking Wine of Cardui? A.—Of course, I want to qualify the word "drink." I cannot answer it by the word "drink." I simply swallowed a few doses.

THE COURT:—They are not trying to make you admit on the witness stand that you got the habit.

The Witness:—Why, about two weeks ago, or three weeks ago, perhaps.

Mr. Hough: Q.—Did your first drink make you feel like you wanted to take another drink of that? A.—No, I don't think so.

The examination then concerned Mr. Warren's understanding of the duties of the Propaganda Department and the distinction between proprietary and patent medicines. Proceeding:

Q.—Do you know of any preparation of medicine, or composition—the composition of which is held to be a secret by the manufacturer, of which the Propaganda Department approves when it is sold to the general public? A.—I do not know that I know of any; but I know this, that there are a very large number of such preparations that the Propaganda Department, so far as I know, has never said a word against, or has even proposed to say a word against, so I assume that there must be a large number. That would be a question properly for the director of the Propaganda Department to answer. I only answer from my opinion.

The witness was then asked concerning his examination of Wine of Cardui, also as to the amount of alcohol in various pharmacopeial and proprietary preparations as compared with the content of Wine of Cardui.

REDIRECT EXAMINATION BY MR. T. J. SCOFIELD

Q.—Now, Mr. Warren, Mr. Hough asked you whether you have ever taken different preparations that he has mentioned. Did you ever take any pure alcohol? A.—Yes, sir. Not any absolute alcohol, no, sir; pure alcohol in dilution.

Q.—When did you do that? A.—About two or three weeks ago.

Q.—In connection with the investigation which you were making and concerning which you have testified here? A.—Yes, sir; the day after I took the Wine of Cardui.

Q.—Now, he asked you whether or not the Propaganda Department of the AMERICAN MEDICAL ASSOCIATION had approved different proprietary or patent medicines. I will ask you whether or not it is the function, as you understand it, of the Propaganda Department to approve any patent medicine? A.—It is not.

Q.—Or proprietary medicine. A.—It is not.

Q.—Their function is to denounce a fraudulent medicine, isn't it? A.—Yes, sir.

The further hearing of the cause was then adjourned until 2 o'clock the same day.

March 31, Afternoon

The court met pursuant to adjournment. Mr. T. J. Scofield presented Dr. Loevenhart as a physiologic chemical expert.

TESTIMONY OF DR. ARTHUR S. LOEVENHART

DIRECT EXAMINATION BY MR. T. J. SCOFIELD

Dr. Arthur S. Loevenhart received the bachelor's degree in Kentucky State University in 1898; Master's Degree in the same institution 1899, Doctor of Medicine, Johns Hopkins University in 1903. He was first assistant, then associate and for two years Associate Professor of Physiologic Chemistry and Pharmacology in the Johns Hopkins University Medical School. Subsequently in 1908, he was called to the chair of Pharmacology and Toxicology in the University of Wisconsin, which chair he holds at the present time.

Dr. Loevenhart defined physiologic chemistry, pharmacology and toxology. He also testified as to his membership in various scientific organizations, as to his research work and his associations with various scientific journals.

He had analyzed two samples of Wine of Cardui, one received from the American Medical Association in its original carton, the other purchased in the open market by himself.

He was asked concerning his analyses:

Q.—State briefly the difference between the two. A.—The difference between the two—while they seem large in some respects, I regard as absolutely insignificant. I found that the second specimen contained perhaps ten to fifteen per cent. more of solid residue. I found that it contained about ten or fifteen per cent. less of this reducing sugar, which I regard as glucose; and it contains approximately ten or fifteen per cent., something in that neighborhood, less of ash; but these differences I regard as insignificant.

Q.—Why, Doctor. A.—For this reason, in making a preparation of this kind, the different lots of the plant from which you make the material vary; they must vary. They vary from season to season; also

there are small differences in the composition of plants, from season to season, or the locality from which they are collected; insignificant differences in the main, but differences that are perfectly appreciable to the chemist. And the caramel, with which this material is evidently colored varies in composition. It is simply burned sugar, and it is on the market in that form, and burnt sugar is on the market for coloring purposes and it varies in composition; and you cannot always get the same consistency. To all intents and purposes it is the same, it is the same color, and that is what you are using it for; but chemically you may have to use a little more, and you get a little lighter or a little darker burnt sugar, so that you change the amount to match the color, rather than put in a definite amount of the material.

For these reasons I regard the differences between the two specimens of Wine of Cardui as entirely insignificant, inconsequential and unavoidable.

The witness also analyzed a synthetic preparation which he found was midway between the two preparations which he had analyzed and that it was not distinguishable from the others.

He was asked:

Q.—Now, as the result of your chemical analyses, what would you say as to the presence of any substance or substances in the Wine of Cardui which could exert any appreciable action or effect in the body either in health or disease, when administered by mouth and taken into the stomach in doses recommended for Wine of Cardui? *A.*—If I understand that question correctly, I should say that the chemical analysis failed to reveal any substance in Wine of Cardui other than alcohol which could have any effect in the body, either in health or disease.

The Court:—The only difficulty with that answer is, Doctor, that it amounts to nothing, because we do not know whether you understand that question correctly. You said if you understand the question.

The Witness:—I think I understand it.

The Court:—Well, let us have it, then, so that we know what your answer is.

The Witness:—Read it, please.

(Question read.)

The Witness:—My answer to that — I had that question correct and my answer will stand.

Mr. T. J. Scofield: *Q.*—Do you understand the question, Doctor? *A.*—Yes, sir; and the answer given is that the analysis — my chemical analysis failed to reveal any substance present in the Wine of Cardui — well, I would like to modify my answer slightly, if I may.

Q.—All right; answer it. *A.*—The analysis, as made by me, failed to reveal in Wine of Cardui any substance which, taken in the dose recommended for Wine of Cardui, could exert any appreciable effect in the body, except the alcohol. With this reservation that the material is bitter.

The witness then testified as to the relation of Wine of Cardui and the synthetic preparation to fluid extract of viburnum prunifolium, stating:

Mr. T. J. Scofield: *Q.*—Now, in obtaining equivalent doses of viburnum prunifolium, as contained in the fluid extract of viburnum prunifolium, and the viburnum prunifolium as contained in the synthetic preparation of Wine of Cardui, how much alcohol would have to be consumed relatively? Will you answer that? *A.*—In obtaining equivalent doses from the synthetic preparation and from the Wine of Cardui, 27 times as much alcohol would be consumed when taken in the form of the synthetic preparation as when taken in the form of the official fluid extract of viburnum prunifolium — approximately.

The witness then described his pharmacologic action of Wine of Cardui. He had studied the effect of Wine of Cardui on the circulation and respiration of dogs. He described in detail the technic of this investigation. A teaspoonful of Wine of Cardui, in a dog weighing 14 pounds, produced no appreciable effect on the circulation or respiration.

The witness produced charts as records of this investigation and analyzed them for the jury. The chart was introduced as defendant's exhibit.

The witness was then asked:

Mr. T. J. Scofield: *Q.*—Doctor, would the fact that Wine of Cardui produces no effect, have any bearing on the question of whether it would increase the menstrual flow? *A.*—The fact that it has no effect on the blood pressure or respiration?

Q.—Yes. *A.*—Yes, sir.

Q.—As per your experiment? *A.*—Yes, sir.

Q.—What would you say as to whether it would or would not? *A.*—That requires, of course, an explanation. Drugs can be conceived to act on the menstrual flow only by influencing the amount of blood which flows through the blood vessels of the uterus or womb. A drug, in order to increase the flow, the menstrual flow, must increase the flow of blood through the womb. Now, this increase of flow through the womb could conceivably be brought about by one of two conditions; either, in the first place, by acting on these blood vessels, thus causing them to dilate — and, suppose the fluid vessels of the womb were like that (indicating with hands), a drug which could dilate those vessels and cause more blood to pass through them — that would cause a congestion of the womb and tend to increase the menstrual flow.

A drug could also increase the menstrual flow by acting on the wall, the muscle wall of the womb or uterus. If a drug caused the walls of the uterus — which is a hollow organ, of course, to become flabby, flaccid and relaxed, the vessels would — it would allow of a larger flow of blood through the vessels of the womb. And, contrariwise, a drug which tends to constrict the blood vessels, contract them down, so that the hole was very small, as if it had to flow through a very small pipe — it would tend to decrease the amount of blood flowing through the uterus; and a drug which acted on the wall of the uterus, in which these blood vessels run, causing it to go into contraction, would squeeze down on these vessels, and narrow them, and in that way, narrowing the blood vessels would decrease the blood flow through the womb, and decrease the menstrual flow; just as when you increase the blood flow you increase the menstrual flow.

Now, if this drug acted directly on the walls of the blood vessels, causing an increased flow of blood through the womb — dilating them, in other words — and thereby acting to increase the menstrual flow, it would have been indicated in my record; because when these blood vessels are dilated, the blood pressure would have been changed; and it would have been clearly indicated in my record; and, if this drug, Wine of Cardui, had the power of dilating the vessels of the womb, it would have clearly been indicated in my record on the blood pressure. It did not happen, and, therefore, there was no increased blood flow through the womb, or through any of the organs. In nearly all such cases no one single organ is affected that way, but many organs are affected.

There was no change in the blood pressure, and, therefore, I may state, and draw the conclusion that Wine of Cardui does not act on the walls of the blood vessels, either constricting them or dilating them, and it is absolutely inert with regard to the blood vessels.

Q.—Doctor, have you ever administered Wine of Cardui to a human being? *A.*—Yes, sir.

Mr. T. J. Scofield:—Just a moment. I will withdraw that last question for a short time.

Q.—How may a drug reduce or stop excessive menstrual flow, or any uterine hemorrhage? *A.*—I just— that is partly covered in my last explanation, but I may repeat it.

Q.—In what way, in the decrease or increase of the blood pressure? *A.*—Yes. A drug can decrease the menstrual flow only by decreasing the blood flow through the womb, and that decrease in blood flow through the womb can be accomplished by constriction or contraction of the blood vessels; by acting directly on the blood vessels or action on the whole uterine wall, making it contract—it is a muscular organ, of course—squeezing down the blood vessels, narrowing them in that way. (Indicating with hands.)

Q.—Doctor, what do you mean by a uterine tonic; if there be such a thing? *A.*—The word "tonic," in connection with the muscular tissue, refers to its state of contraction. I perhaps can best illustrate it with my arm. This biceps muscle, in my arm, will bend my arm. (Witness indicates by raising and lowering arm.) That muscle, now, has very little tone; the tone of that muscle is low, because it is extended, it is elongated. Now, its tone has increased (indicating by flexing arm), and it is increasing right along, and now it is in the condition of maximum tone.

Now, in reference to a muscular tissue a drug is a tonic, if it causes a contraction—a continuous contraction. Now, of course, while that arm is contracting, it may be showing relaxations and contractions, little ones, up here (indicating on arm); it may be in this condition and show relaxation and contractions still, but the condition of the tone—or its average shortness or average length in contraction or relaxation—this is relaxation and this is contraction— (indicating by flexing arm)—will be considered the tone of the muscle.

Now, with the uterus, which is a muscular organ, it may relax and be flabby, or it may be hard and contracted, squeezed down.

Now, the uterus, of course, normally, shows rhythmic movements, slow, rhythmic movements of contraction and relaxation, very slow, of course; but it is capable of contracting down hard.

Now, a drug could reasonably be called a uterine tonic, if it has the power of making the uterus contract and pass into a condition of tone, corresponding to the condition of my biceps, or corresponding to this (indicating by clasping hands)—considering a hollow organ like these hands together, squeeze them tight together, instead of having them loose or flabby—then they are in a condition of tone.

Anything that is called a uterine tonic should be capable of producing a tonic contraction in the uterus. That is the technical meaning of the word "tone"

Q.—Doctor, would it be possible for one and the same person—or, one and the same preparation, used in the same dose to be useful in the treatment of directly opposite conditions, such as a decreased and diminished menstrual flow, an excessive menstrual flow and uterine hemorrhage, and also to be useful during pregnancy? *A.*—No, sir.

Q.—Why not? *A.*—The answer follows directly from a previous explanation. If there is an increased menstrual flow, that is due, or must be related to the congestion of the uterus, too much blood in the vessels of the uterus—congested.

Now, a drug that would be useful there would have to constrict them and lessen the blood flowing through the uterus. You could not use a drug that would still further dilate the uterus and give it more blood, because you would thereby increase the congestion, and the menstrual flow would be further increased.

To be useful, in excessive menstrual flow, you would have to have a drug that would either cause the vessels to constrict by their own action, or the muscle walls of the uterus to constrict them.

Now, in case of decreased menstrual flow, that means there is not enough blood flowing through the uterus; and it can be increased by relaxing the uterus, relaxing the walls of the blood vessels so that the blood can flow through more freely. If you gave the same drug which was useful in an excessive menstrual flow, it would now

result in causing a further constriction, and it would make the condition worse.

The two cases require opposite effects; one requires relaxing the vessels of the womb for more blood to go through, and the other requires the constriction so that less blood may go through the uterus. One drug will not do two opposite things in the same dosage.

Furthermore, a drug which would be useful in excessive menstrual flow by causing contraction, and thereby decreasing the blood flow through the womb, would be dangerous during pregnancy, because it might precipitate an abortion. We never give a drug during pregnancy, which stimulates the uterine contractions—if you do that you would tend to precipitate an abortion, a premature birth, so that it could not be possibly useful—in fact, it would be dangerous. If it is a good thing in excessive menstrual flow, it must be dangerous during pregnancy.

If it is good for excessive menstrual flow, it is the opposite of what is wanted for decreased menstrual flow. If it is good for decreased menstrual flow, it is contrary, or exactly the opposite of what you would want in increased menstrual flow.

In other words, a thing is not plus and minus at the same time.

The witness then testified that he took at 11:30 in the morning, a full bottle of Wine of Cardui. Up to 12:30, there was a flushing of the face, slight sweating, difficulty in articulation. He noticed a certain amount of tingling in the legs and numbness. There was poor muscular coordination. At 12:30, the maximum effect was obtained which lasted until 2:30 when the effects began to wear off and were replaced by drowsiness and rather violent headache. There was no nausea.

The witness attributed the effect to the alcohol which the Wine of Cardui contained because the effects were absolutely typical of the moderate alcoholic intoxication; he had experienced no other effect on taking, on a previous occasion, the Wine of Cardui from which the alcohol had been evaporated.

He was then asked:

Q.—Doctor, do you think that Wine of Cardui could be used as an intoxicant— *A.*—I am absolutely—

Q.—And that in doses required to intoxicate it would not produce nausea? *A.*—I am absolutely sure of the—of course, I may say that I am not sure that all people could take it—I am absolutely sure that I can use it as an intoxicant.

Q.—Doctor, can you state what amount of alcohol is necessary to be taken to produce intoxication in an adult person, either a man or woman? *A.*—No, sir; I cannot.

Q.—Why? *A.*—The amount of alcohol required to produce intoxication in an adult man or woman varies under a great many conditions. In the first place, it depends on that person's habits. If he is used to taking alcohol, the dose which will be required to intoxicate will be larger than if he is unused to alcohol. In the second place, it will depend somewhat on his size; the larger the individual, the more alcohol it will take to intoxicate him. In the third place, it will depend on the condition of the stomach. If the stomach is empty that material will be more rapidly absorbed than if it were full and were mixed with the whole quantity of food that is in the stomach, so as to delay the absorption of it. So that, if the stomach is empty, it takes a smaller amount to intoxicate than if the stomach is full.

It depends somewhat on the time of day; because, it is common knowledge, of course, that a cup of coffee at night affects one much more than a cup of coffee in the morning.

It depends upon the surrounding circumstances. If a person takes alcohol, as I did in my laboratory when I was busy and had things to do, things to occupy my mind and nothing to excite me, it has much less effect than if I had been out in company with people and was talking and excited; it would take less alcohol to produce symptoms of incipient intoxication than it would in the quiet of my laboratory.

So there are a vast number of conditions. Then there are certain idiosyncrasies, as some people are more susceptible anyway, to alcohol, and some are less susceptible—it simply takes more just as it does of drugs—susceptibility to any drugs, intoxication by any drug will vary, so that the dose to get the same effect will be different in different individuals.

The witness then testified as to the effects of alcohol on the stomach. Assuming that alcohol will hasten the absorption of the Wine of Cardui he said that there would be no necessity or any advantage in hastening its absorption because Wine of Cardui is to be started two or three days before the menstrual period and has therefore, two or three days in which to be absorbed.

The witness then testified that he had evaporated the alcohol from the Wine of Cardui, made up the residue into twenty-four pills and administered them to a woman who was absolutely normal. He started administering the drug the day before the menstrual period. It had absolutely no effect on the period so far as could be determined.

Experiments were made by Dr. Loevenhart on thirteen rabbits with Wine of Cardui and with alcohol. He found that Wine of Cardui is as intoxicating as the same proportion of alcohol.

As to the toxic action concluded from his experiment, he said:

A.—I conclude that there is absolutely nothing in Wine of Cardui which can intensify the toxic action of alcohol. There is nothing in the Wine of Cardui which reduces the toxic action of alcohol. In other words, there is nothing present which modifies in any way the toxic or poisonous action of the alcohol which this material contains. And since there is nothing present when it is administered in toxic doses to modify the action of the alcohol, it seems a fair conclusion, especially in conjunction with the chemical analysis, that there is nothing present in the Wine of Cardui which can modify the therapeutic action of the alcohol which the Wine of Cardui contains.

The witness was asked:

Q.—Now, Doctor, from your chemical, pharmacologic and toxicologic investigation, have you an opinion as to whether Wine of Cardui contains anything else that is potent than alcohol? *A.*—No, not unless you consider the iron and the valerianate which it contains as active, potent.

Q.—Well, may iron be useful in the treatment of menstrual disorders? *A.*—Yes, sir; in certain forms of menstrual disorders it may be useful.

The witness was then informed that, according to the testimony of Dr. Leech, Wine of Cardui contains six ten-thousandths of one per cent. of iron; therefore, he was asked, how much Wine of Cardui would have to be taken by a woman in order that she might get a medicinal dose of iron? He estimated that she would have to take 2½ gallons three times a day; he also estimated that she would have to take 2⁷⁄₁₀ gallons of Wine of Cardui to get the effect of the valerianate.

The witness testified that the 20 per cent. of alcohol in Wine of Cardui would not dissolve the residue of viburnum prunifolium, the resinous constituents of carduus benedictus and that it would not dissolve volatile oils; therefore the only effect of alcohol on the preparation is the action of the alcohol itself.

He was asked:

Q.—Now, Doctor, what is your opinion, based upon your knowledge of chemistry, toxicology and pharmacology of the value of McElree's Wine of Cardui in the treatment of disease under the experiments which you have made, and the testimony which you have given here? *A.*—In the first place, in answering that question I would like to dispose of the proposition that Wine of Cardui is bitter. Whatever effect a bitter substance may have in the body, good or bad, in the treatment of disease as it passes through the mouth, in consequence of its bitter taste, Wine of Cardui has. Although, of course, it may not be necessary to present a bitter substance in that form with the presence of that amount of alcohol. In so far as the other constituents of it, apart from the bitter taste: It is worthless, except for the alcohol, and in so far as it presents to the public for indefinite use alcohol in a preparation which does not require alcohol, pharmaceutically or medically require alcohol, to my mind it is vicious.

Q.—When you say it is vicious, what do you mean by that? *A.*—I mean it is vicious because it places in the hands of the public, with the advice to use continually over a long period of time in doses of two or three tablespoonfuls a day, a material which could be presented without the alcohol; a material which is inert except for its bitter taste and its alcohol, and a material which can be used as an intoxicant, and since it can be used as an intoxicant, undoubtedly will be used as an intoxicant.

Mr. Walker:—I move that latter be stricken out: "Undoubtedly will be."

The Witness:—In my opinion.

THE COURT:—His opinion may stand in the record.

To which ruling of the Court the plaintiffs, etc., excepted.

CROSS-EXAMINATION BY MR. HOUGH

Dr. Loevenhart was asked concerning any difference which may have existed in his analysis of Wine of Cardui and reports published in THE JOURNAL. He said that there was no essential difference. Dr. Loevenhart was asked concerning his connection with the AMERICAN MEDICAL ASSOCIATION, to which he replied that he is a member of the ASSOCIATION.

To questions, he answered that he is not a practicing physician nor a gynecologist. Proceeding:

Mr. Hough: *Q.*—What effect does the bitter principle in medicine have therapeutically? *A.*—There is an old belief in medicine that bitter substances act as a general tonic, that they improve the appetite and that it is of service in some conditions. The scientific basis of that conclusion is not very well founded at the present time. We have never been able to say very definitely that a bitter substance increases the appetite or improves digestion or increases the absorption of food, but there is a large amount of—there is a fairly widespread belief among medical men, from clinical observation, that bitters do those things in general as a class.

Q.—But you say it has not been proven pharmacologically yet? *A.*—No, it has not.

Q.—The practice of medicine commenced empirically, didn't it? *A.*—Yes, sir.

Q.—That means as the result of use by doctors of certain things they have come to believe that the results were attributable to the use of those things? *A.*—Yes, sir.

Q.—Now in comparatively recent years pharmacology comes in as a new science to try to show the doctor the reason for his belief of the method whereby certain medicines that he has been using for years or centuries accomplish the results. That is pharmacology, isn't it? *A.*—That is only part of pharmacology. Pharmacology is equally engaged in showing the fallacy of his beliefs, in case they are wrong.

Q.—Well, you don't mean to say that a negative pharmacologic test disproves the therapeutic value of medicine, do you? *A.*—Frequently.

Q.—Well, I say as a rule that don't? *A.*—As a rule it does.

Q.—Isn't it a well known fact, both among pharmacologists and therapeutists that a negative test proves nothing? *A.*—No, a negative test proves something.

Q.—Well, but it don't establish the fact that that particular substance has no medicinal or therapeutic value? *A.*—It may have some other effect than that for which it was studied, and of which it proved negative. It is negative in so far as it was studied.

Q.—Did you say that the pharmacologic test is more reliable than the clinical test in determining the value of a medicine. *A.*—Far more.

Q.—Far more? *A.*—Far more.

Dr. Loevenhart was then asked concerning the difference of pharmacologic and clinical experiments, and he was asked concerning the text books used in the University of Wisconsin, continuing:

Q.—What are used in your own department? *A.*—My students buy what books they care to. I have no preference what books they use.

Q.—What books do you use in examining them? *A.*—I use no books in examining them.

Q.—What books did you use when you were studying? *A.*—When I was studying pharmacology, as far as possible I used the original literature. I used some reference books. Among those that I used were Cushny's pharmacology. That, I think, was the only text book I used as a student.

Q.—Is that entitled "Pharmacology and Therapeutics, or the Action of Drugs?" *A.*—I think so. I don't recall its exact title.

Q.—It is a reliable book, isn't it? *A.*—A very reliable book.

Q.—Does not Cushny state that the negative test absolutely proves nothing, and must be disregarded? *A.*—I don't know what he states in that line. I do not recall.

Q.—You studied it, you say? *A.*—Yes, but I don't purpose to know every sentence there is in it.

Q.—Well, if he states that, would you disagree with him? *A.*—I have stated what I think. Now if that disagrees with him, I disagree with him. If it agrees with him, I agree.

Q.—You mean that you are an authority unto yourself on that? *A.*—To myself I am the final authority.

Mr. Walker:—He is on good terms with himself.

Mr. Hough:—Would you agree or disagree with this statement from Cushny:—

Mr. T. J. Scofield:—Now, if the Court please, I object to reading any statement from any book that he has there.

THE COURT:—Well, supposing that Mr. Hough puts it in his own language, as coming from Mr. Hough instead of from Cushny; you could not object to it. Then, afterwards, when the book is introduced in evidence, if it is, the significance of it will appear.

Mr. T. J. Scofield:—I deny the admissibility of it in evidence.

THE COURT:—It is not important whether this witness agrees or disagrees with Cushny. The witness has already given evidence of his independence.

Mr. Hough:—If the Court please; as I understand the rule with reference to the introduction of medical books it is this: that, if a witness states that a certain book is a recognized or standard work on the subject and he states that that book does not, in his opinion, state a certain thing, you can read to him from that book and thus contradict the witness.

THE COURT:—This witness has told you very frankly that he did not recall everything that he read in the book, or the particular thing involved in the question you put to him—he stated if it is in the book, as he stated it, he agreed with it and if it was different he disagreed with it. I think at the present time, the witness has not specifically disagreed with anything in the book.

Mr. Hough:—Does your Honor rule that when it comes time for us to present our side of the case, we may then read from the books where they contradict the witness.

THE COURT:—If this witness has said anything as coming from Cushny's book which is not there or has said something is there which is not, you may use the book to contradict it. But I will say now that I do not recall anything the witness has said up to the present time, that would justify you in reading anything from the book.

To which ruling of the court the plaintiffs, etc., excepted.

The witness was then asked as to his familiarity with the contents of text books. Argument was then made by attorneys of both sides as to the admissibility of text books in evidence in this case.

The jury was excused. The court stated:

THE COURT:—I will go that far and say that you are entitled to do it just exactly as if the doctor on the stand here said, "Yes, I have those views, and I studied under doctor so and so and I regard him as the ablest man on the subject in the country, and I have received my general education from him and especially on this line." You may then put that doctor on the stand to show that he never taught him any such thing. It is the same thing. If this witness, or any other witness accepts a book as a standard authority you may contradict the witness by that authority.

Mr. T. J. Scofield:—Whether he bases his opinion on that authority or not?

THE COURT:—Yes.

Mr. T. J. Scofield:—In other words, a man can have an independent opinion and state it however well he may—however well he may present it and yet not be free from the possibility of some book (that is not subject to cross-examination) being brought in to state some other opinion.

THE COURT:—No, I think you misconceive the whole situation. Every witness may be as independent as this witness who has said, "If the author of that book states differently, I disagree with him." I do not think there is any difficulty about that proposition.

Mr. T. J. Scofield:—That does not, as I understand the law, lay any foundation for the introduction of the book. The book was not written by any person who was in the position of a witness on the stand testifying under oath.

THE COURT:—The book is brought in here by the witness himself. You must presuppose that proposition.

Mr. T. J. Scofield:—That is a different proposition.

THE COURT:—And then the witness states that he relies on that book—

Mr. T. J. Scofield:—And that is different. Where he says he relies upon it.

Mr. Hough:—The reason of the rule, your Honor, is more strongly in favor of admitting the book that has been identified as a standard book, than the testimony of a witness who has prepared with reference to a particular case. The man who wrote the book did not write it with reference to any particular case to help one side or the other. He wrote it as an abstract proposition to be taught to the students who were to be educated.

THE COURT:—Oh, well, it seems to me, Mr. Hough, that a witness who is under oath in this court is at least as truthful and honest as the man who wrote the book.

Mr. Hough:—I do not mean to reflect on any witness or the honest intentions of the witness, but human nature is human nature and a man who writes of a subject without any particular partisanship one way or the other, is more apt to state his proposition unhedged by unconscious bias than a man who is on the stand, feeling that it is incumbent upon him to sustain a certain theory. So that I submit there must be some method whereby a book can be read from that is recognized as a standard book, to contradict the witness where the witness makes a statement which is contrary to what is in the book.

THE COURT:—Of course you could easily get into a position where the jury would be obliged to reach a verdict on the theory that there are seven books on this side, and four on the other.

Mr. Hough:—Of course that should be avoided also.

THE COURT:—Absolutely.

The further hearing of the cause was adjourned until Monday, April 3, 1916, at 10:30 a. m.

(To be continued)

Correspondence

Data on Hay-Fever

To the Editor:—We have received a large number of letters regarding the compilation of data on hay-fever as a result of an article "Hay-Fever: Its Cause and Prevention" (THE JOURNAL, March 4, 1916, p. 707). The American Hay-Fever-Prevention Association desires especially to receive the following data: the sex, age and occupation of hay-fever sufferers, the duration of the disease and date of commencement and ending of the attacks. If a report is obtained from a botanist giving the names of the most common anemophilous plants pollinating during the time of the attack, the information will be more valuable.

Attacks of pollinosis frequently cease from a change of wind or other reasons diminishing the supply of pollen or sometimes permanently from changing the residence to a locality removed from the exciting pollens, or from gradually developing immunity, and many remedies are therefore *post hoc, ergo propter hoc.* Remedies should therefore not be submitted unless they have been tried in a sufficiently large number of cases and carefully checked.

Physicians desiring to organize hay-fever-prevention associations, affiliated with the national association, may obtain a copy of the plan and of the constitution and by-laws of the Louisiana State Hay-Fever-Prevention Association, and will be given every reasonable assistance.

W. SCHEPPEGRELL, M.D., New Orleans.
President, American Hay-Fever-Prevention Association.

A Proposed Undergraduate Course in Clinical Physiology

To the Editor:—The article on this subject by Professor Lee (THE JOURNAL, Feb. 26, 1916, p. 639) is a remarkable contribution to medical literature. In this article a teacher of physiology frankly admits that the existing course in physiology is apparently an educational failure; that the students (undergraduates) question its value; that at the end of the required two years the students, with a "feeling of relief," leave the course and forget all that has been imposed on them. He further admits that many practitioners "lament their lack of physiologic knowledge," and gladly take up a postgraduate course in physiology that deals with matters of utility, such as "the sounds of the heart and methods of recording them." Yet in the face of this evidence, Professor Lee iterates his belief that "not by changes in existing courses in physiology" is this situation to be remedied.

It is some gain that Professor Lee recognizes the fact that the content of physiology courses as they are being given fails in furnishing the student with the desired "physiologic point of view." It is a further gain to recognize the fact that practitioners are anxious to acquire utilizable physiologic information.

Note that the postgraduate course offered deals with *human* physiology. That is exactly what the undergraduate most needs. He needs interpretation of heart action in terms of sounds and graphs derived from many normal human subjects, not in terms of "refractory periods" and "sino-auricular nodes" derived chiefly from frogs. When he enters the medical school he should drop the academic studies of the premedical course and become a specialist in the study of the *human body*—its normal mechanism and activities in the preclinical years, and its aberrances in the junior and senior years. Let the college teach physiology as a pure science in the department of biology, where it rightfully belongs, and let the medical school deal with applied physiology in relation to the human being. There is no more logic in giving a course in general physiology in our medical schools than in giving a course in general morphology, therein, exceedingly valuable as both courses may be as preparatory work.

As I have elsewhere contended (THE JOURNAL, Sept. 6, 1913, p. 732; *Boston Medical and Surgical Journal*, March 5, 1914), no one has a right to require pure science in the medical school until after the student shall have acquired sufficient skill in the applied knowledge of his chosen profession to insure his meeting with reasonable adequacy the main exigencies of his professional life. Does he acquire that skill, as determined by the "physiologic point of view," by the present methods of physiology teaching? Professor Lee's article replies in the negative. Nor does the student come back for an additional amount of the same kind of teaching; he comes for work in applied *human* physiology—the information which he urgently needs and which was unjustly denied him as an undergraduate.

What is needed in our medical schools is not so much an advanced undergraduate course in clinical physiology but such a practical applied course in freshman and sophomore physiology that the knowledge therein gained can be intelligently correlated with similar instruction in pathology, and advantageously utilized in medicine and surgery. Another thing needed in our Aesculapian pedagogy is a clear recognition that the medical school is, or ought to be, a technical school—a place for the training of men in the art and science of *medicine;* and every department ought to keep that pregnant fact sharply and constantly in view. The principal laggard today is the department of physiology; and the unsatisfactory state such remissness creates is well shown in Professor Lee's complaint. The remedy is plain; why suffer longer the disease?

A. D. BUSH, M.D., Olivet, Mich.
Department of Biology, Olivet College.

A Proposed Undergraduate Course in Clinical Physiology—A Reply

To the Editor:—Dr. Bush assumes an attitude toward both the existing course in physiology and the medical school which is not generally held. It is obviously unnecessary to discuss seriously his characterization of the course in physiology as "an educational failure."

The situation in the school would not be improved by devoting the course to "human" physiology only, even if that were desirable, or were possible in the present state of the evolution of physiologic science. One thing that I tried to make clear in my little paper read at the Chicago meeting is that some knowledge of clinical medicine is necessary before the student can fully appreciate the clinical bearings of physiology. Therefore a change in the existing course in physiology of the first or second year would not give him the physiologic point of view that he should have as a practitioner. He must have his course in physiology early in his medical studies; but later, with a clinical background, he could profitably follow a course in clinical physiology, in which he could learn how to look at various clinical problems from the standpoint of physiology more clearly than before.

The inclusion of general physiology among the other biologic sciences as a topic of general education may be heartily commended—and I may be pardoned for saying that I have advocated this for many years and have tried in diverse ways to bring it about. But this would not relieve the medical school of its physiologic opportunities and responsibilities. It would be a sad day for medicine, for medical science and medical education, if the medical school should degenerate into a mere technical school. If physiology is indeed "the principal laggard" [sic] today in preventing such a catastrophe, all honor to her!

FREDERIC S. LEE, Ph.D., New York.
Columbia University, College of Physicians and Surgeons.

Alarming Symptoms Caused by Diarsenol

To the Editor:—In THE JOURNAL, March 18, 1916, p. 865, was a report of three cases of temporarily bad results from the use of diarsenol, written by Dr. A. H. Cook. I have had two such experiences but, having discovered that it occurred only after a certain lot of diarsenol of the serial number B3400, I think it wise to report this fact, as otherwise a great many physicians may be deterred from giving the drug.

In explanation I will state that after giving several hundred doses of diarsenol without any bad effect whatever, I had two cases with the nausea, vomiting and symptoms of apparent collapse such as described by Dr. Cook. When I investigated at the Southern Pharmacy, which acts as purchasing agent of salvarsan and such drugs for the physicians in this building, it appeared that all of the bad results

reported by Dr. Cook, my two cases and two more occurring in the practice of Dr. E. D. Holland, all of us in the Dugan-Stuart Building, were due to diarsenol of the series mentioned above. This had been received by the pharmacist on a back order and at almost the same time he received a lot of the series 05600.

None of the diarsenol which was used here freely before this series B3400 gave any trouble. None of the series 05600 has given any trouble. In fact, the product now is much more soluble and makes a much lighter solution and has the physical as well as chemical appearance of salvarsan. The bad lot that gave us trouble made a dark smoky solution when dissolved in distilled water. This cleared somewhat after being made alkaline and being diluted with salt solution. The diarsenol now marketed has none of this dark appearance, but makes a bright yellow solution from the start.

E. H. MARTIN, M.D., Hot Springs, Ark.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

LITERATURE ON ROENTGEN RAY BURNS

To the Editor:—Will you please inform me where I can obtain literature regarding the pathology and treatment of x-ray burns of the abdomen? Can you refer me to any medicolegal decisions on this subject? Kindly omit name and address. R. W.

ANSWER.—The following is a list of articles on these subjects:

Another Victim of the X-Ray, London Letter, THE JOURNAL, March 14, 1908, p. 889.
Carcinoma from Roentgen-Ray Burns, editorial, THE JOURNAL, March 21, 1908, p. 966.
Iselin, H.: Cumulative Roentgen-Ray Burn, *München. med. Wchnschr.*, Dec. 3 and 10, 1912.
Pagenstecher, H.: Severe Roentgen-Ray Burns, *Beitr. z. klin. Chir.*, December, 1912; abstr., THE JOURNAL, March 15, 1913, p. 869.
Conviction of Physicians for X-Ray Injuries, Berlin Letter, THE JOURNAL, Feb. 15, 1913, p. 533.
Becker, P. F.: Roentgen Dermatitis from Standpoint of General Practitioner, *Deutsch. med. Wchnschr.*, March 13, 1913.
Eddowes, A.: New Operation for Ulcers in Roentgen-Ray Scar, *Med. Press and Circular*, April 23, 1913; abstr., THE JOURNAL, May 24, 1913, p. 1670.
Liability of Employers for Injuries from X-Rays Applied on Their Demand, Miscellany, THE JOURNAL, June 14, 1913, p. 1908.
Coley, W. B.: Epithelial Tumor Developing at Site of Roentgen-Ray Dermatitis, abstr., THE JOURNAL, June 21, 1913, p. 2025.
Eliot, E.: Legal Responsibility of Surgeon and Practitioner Which Use of Roentgen Ray Involves, *New York Med. Jour.*, Oct. 25, 1913.
Pfahler, G. E.: Present Day Danger of Roentgen-Ray Burns and How to Prevent Them, THE JOURNAL, Jan. 17, 1914, p. 189.
Kempf, F., and Pagenstecher, A.: Operative Treatment of X-Ray Burn, *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1913, xxvii, No. 2; abstr., THE JOURNAL, Jan. 31, 1914, p. 419.
Dubois: Roentgen-Ray Cancer, *Rev. méd. de la Suisse romande*, Jan. 20, 1914.
McClintock, J. C.: Treatment of Some Effects of Roentgen-Ray Burns, *Kansas Med. Soc. Jour.*, August, 1914.
Dodd, W. J.: Treatment of Acute Roentgen Ray Dermatitis, *Am. Jour. Roentgenol.*, September, 1914; abstr., THE JOURNAL, Oct. 10, 1914, p. 1321.
Roentgen-Ray Liability—Changing Physicians—Expert Evidence, Miscellany, THE JOURNAL, Nov. 21, 1914, p. 1875.
Bucky, G.: Severe Roentgen-Ray Burn after Gynecologic Deep Exposures, *Berl. klin. Wchnschr.*, Dec. 21, 1914.
Abbe, R.: Roentgen-Ray Epithelioma, Curable by Radium, THE JOURNAL, July 17, 1915, p. 220.

INCONSISTENCIES IN THE HARRISON NARCOTIC LAW

To the Editor:—Some inconsistencies appear to crop out in the Harrison Narcotic Law. Paregoric is sold in any quantity to anybody, but a physician's prescription containing paregoric cannot be refilled. Bell's Syrup of Codein, a proprietary medicine said to contain 1 grain of codein to the ounce, is sold in a prescription or without being prescribed, whereas a prescription containing codein sulphate, 1 grain to the ounce or even less, comes under the new law and cannot be refilled. F. POWERS, M.D., Westport, Conn.

ANSWER.—As explained last week (Paregoric Exempt Under the Harrison Law, p. 1051), the inconsistency referred to by our correspondent has been partially removed by Treasury Decision 2213, which permits the refilling of a physician's prescription containing as one ingredient a preparation exempted under Section 6 of the law. The necessity for this interpretation was unfortunate. The continued use of small doses of a narcotic drug is just as capable of establishing a habit as in the case of larger doses.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Regular, Little Rock, May 9. Sec., Dr. T. J. Stout, Brinkley; Eclectic, Little Rock, May 9. Sec., Dr. C. E. Laws, 712 Garrison Ave., Fort Smith.
DISTRICT OF COLUMBIA: Washington, April 11. Sec., Dr. E. P. Copeland, The Rockingham.
ILLINOIS: Chicago, May 4-6. Sec., Dr. C. St. Clair Drake, Springfield.
MASSACHUSETTS: Boston, May 9-11. Sec., Dr. Walter P. Bowers, Room 501, No. 1, Beacon St., Boston.
NEVADA: Carson City, May 1. Sec., Dr. Simeon L. Lee, Carson City.
NEW MEXICO: Sante Fe, April 10. Sec., Dr. W. E. Kaser, East Las Vegas.
NEW YORK: Albany, Buffalo, New York and Syracuse, May 16-19. Sec., Mr. Harlan H. Horner, Chief Examinations Division, Educational Bldg., Albany.
OKLAHOMA: Oklahoma City, April 11-12. Sec., Dr. Ralph V. Smith, 502 Daniel Bldg., Tulsa.

THE FUNCTION OF THE DISPENSARY*

It was suggested to the committee by the president of the Association that the dispensary or outpatient department as a factor in medical instruction should be taken up for discussion this year. In presenting their report, the members of the committee wish to state that in its preparation the executive officers of many medical schools were consulted, and they desire to express their gratitude to these gentlemen for their many helpful suggestions.

A satisfactory discussion of the part which may be played by the outpatient department in medical instruction is hardly possible without a consideration of the functions, organization and equipment of such a department. It is, we think, fair to state that the dispensary or outpatient department has in but few institutions received the attention which it has deserved. As one of our correspondents remarks, "The dispensary . . . has been treated in a stepmotherly fashion while the hospital has been the favored child." It is difficult to see why this should have been the case for, after all, the functions of a dispensary are essentially the same as the functions of a hospital, namely, the adequate care of the patient, the instruction of medical students, and the advancement of medical knowledge. From most points of view the same conditions hold in the dispensary as hold in the hospital. Adequate care of the patient must include not only careful examination and proper treatment, but also instruction in methods of life and the prophylaxis of disease. The dispensary should be a center for the dissemination among the public of knowledge of preventive medicine. In the dispensary, just as in the hospital, the presence of the medical student not only adds to the effective working force, but also stimulates the attending physicians to a better type of work. The advancement of medical knowledge by means of research has been, we believe, sadly neglected in most dispensaries, but there is no reason why adequately equipped dispensaries should not be a source of material for research, and on the other hand, there are some reasons why they are likely to be one of the main sources of material for the investigation of the early stages of many chronic diseases.

There are certain fundamental differences between dispensary patients and hospital patients, even though there is frequently no sharp line of demarcation between the two. The nonresident character of dispensary patients renders them less capable of control, and for that reason less subject to continuous study and supervised treatment. Under the newer conditions of dispensary organization, however, these difficulties can be largely minimized. It is true also that the patients encountered in dispensary practice ordinarily differ from the hospital patient in the type of disease they present. The hospital patient is usually suffering from an acute infectious disease or from the terminal stages of a chronic disease. The dispensary patient is usually suffering either from some minor ailment, from a chronic disease in its incipiency, or from an advanced chronic disease still in the ambulatory stage. In brief, the dispensary patient represents the type of

* Report of the Committee on Equipment, read at the meeting of the Association of American Medical Colleges, held in Chicago, Feb. 8, 1916.

patient that usually consults a physician at his office. As contrasted with the hospital, therefore, the dispensary offers much greater opportunities for the study of minor ailments and for the study of incipient chronic diseases. For the last reason alone, all possible diagnostic methods capable of application in ambulatory patients should be at the disposal of the dispensary physician. It is the dispensary physician who has the greatest opportunity of discovering the early manifestation of those serious chronic diseases which at the present time so frequently reach the hospital at a period when they have already become incurable. The problems presented to the dispensary physician, therefore, are by no means simple, and it is a common but mistaken assumption that medical fledglings are capable of adequately caring for this important work.

The deficiencies in organization of many existing dispensaries have to do with both their physical and human equipment. Through lack of foresight, lack of means or faulty arrangement of space, many of our dispensaries are wofully overcrowded. In many outpatient departments, even in large cities, trained supervision of the dispensary work is lacking. An insufficient social service department, or indeed the complete absence of such a department, is frequently to be noted. The clinics often attempt to cover too much ground, the medical assistance is frequently insufficient and badly classified, the records are often hardly worthy of the name, and in some institutions the lack of unity between the hospital and dispensary work is a serious defect.

In these days of efficiency experts it is hardly necessary to point out that the work of a dispensary can be greatly facilitated by sufficient space and, what is even more important, proper arrangement of that space. We believe that it is possible to work out a satisfactory unit arrangement for a teaching dispensary, and we have attempted in the accompanying sketch to suggest such a unit. We believe that the best general dispensary plan is one in which there is a central waiting room or corridor surrounded by suites of examining or dressing rooms entered from an inner corridor. Each clinic should control a working unit, and each unit should consist of a central admitting room which connects directly with the general waiting room, flanked on either side by a series of unit rooms, modified according to the need of the particular clinic. In the central admitting room of each unit the current records are kept, and the room is divided into a series of cubicles in which the histories of the patients are taken. The patient is examined or dressed in one of the small rooms which do not connect directly with the general waiting room but are separated from it by an interior corridor. The idea of the plan is that, inasmuch as many old patients do not require a complete physical examination, the cubicles of the admitting room can be used for handling them as well as for taking the histories of new patients. Each new patient, after having the history taken in the admitting room, is transferred to an examining room for a thorough physical examination. The division of the examining room into two groups by the admitting room separates the males from the females. It is a simple matter for an architect to arrange the fenestration so that rooms consisting of units or combinations of units are obtainable.

For the proper administration of the dispensary there should be in charge of it a superintendent who may or may not be a physician, but who must have had training in the social side of dispensary work. The superintendent should devote his entire time and energy to the work, and should be sufficiently well remunerated so that he can afford to do this. There should be a sufficient force of admitting clerks properly to register and index the patients, the clinics should be properly supplied with nurses, particularly those clinics in which women are patients, and clinic secretaries have proved of great value in the Massachusetts General Hospital outpatient department. The latter are young women who are desirous of doing philanthropic work and who volunteer to keep the clinics running by taking general charge of the patients, seeing that their records are properly distributed and properly filed after the daily session, caring for the transfer of patients from one department to another, caring for the follow-up systems, weighing patients, taking temperatures, and other minor duties.

It has yearly become more evident that no dispensary can be satisfactorily conducted without an adequate social service department. Those of us who have had an opportunity of working with a social service department can look back with feelings almost of horror to the time when we attempted to do without one. The reasons underlying the necessity for this department are now so obvious and well recognized that further comment is unnecessary.

Perhaps the most important essential in the proper conduct of the dispensary is an adequate medical staff, and it would seem as though it was advantageous to divide the medical attendants into the teaching staff, who should be more or less permanent paid men responsible only for the supervision of students and for teaching, and the service staff, who are unpaid volunteers whose business it is to take care of the routine work of the dispensary. In our experience it is necessary to have at least one paid man in each department. Where the dispensary is affiliated with the hospital the house staff of the hospital may well spend part of their time in the outpatient department. In a teaching dispensary it is very important that the heads of departments shall give their services to the institution at regular intervals. One of the main difficulties in the conduct of many dispensaries has had to do with obtaining a sufficient number of well trained young men to conduct the routine work. The main source of this difficulty in our opinion has been the condition of overcrowding and hurry that is characteristic of so many dispensaries and which serves not only to rob the attending physician of whatever benefit he might obtain, but also tends to convert him into a slipshod routinist. We cannot expect to attract first class men to dispensary positions until we can so arrange dispensary conditions that the work they obtain is of distinct benefit to them.

The question of dispensary records is a very important one. Unless carefully and properly kept, the records are worthless. Making all allowances for the differences in conditions, they should be as carefully and accurately kept as hospital records. Indeed, the ideal system is to keep them on the same blanks as the hospital records and to have the records of the hospital and the outpatient department interchangeable. In some institutions the hospital and dispensary have a common history room and, while there may be local reasons why this may not always be desirable, the principle should be followed where possible.

The advantages to the dispensary of close affiliation with the hospital can be fully appreciated only by those who have worked in a dispensary which is not so situated. A dispensary is a natural feeder of a hospital, and where the two are separate the difficulties as to the transfer of patients from one to the other are great and each institution loses in efficiency on account of the unnecessary duplication in equipment and staff which such a separation involves.

The equipment of a dispensary can be summed up in a general way in a sentence. It must be such that thorough examination and treatment of all patients is possible. This means, of course, that the dispensary workers must have at their command all of the usual clinical instruments of precision — thermometers, stomach tubes, blood counters, microscopes, cystoscope, etc. Further than this, there must be the necessary laboratory space for the routine laboratory procedures. From the standpoint of dispensary efficiency, a central laboratory is perhaps the best. From the standpoint of medical teaching, small clinic laboratories are perhaps better, as they allow the student to study each patient completely himself. The dispensary should also have an efficient Roentgen-ray department both for diagnosis and for treatment, a heart station with the necessary instruments, and a department of physical therapy in which massage, electricity, hydrotherapy and mechanotherapy can be carried out. It goes without saying that certain departments will require specially equipped rooms, such as dark rooms, plaster rooms, rooms for stomach washing, cystoscopic rooms, etc.

The question of the use of the dispensary in teaching may be considered from the point of view of the teacher or of the student. All of the dispensary workers engaged in teach-

ing should be appointees of the medical school, should be paid men, and should be required to make teaching their chief work. Each clinic should be in charge of a paid instructor who should conduct it and personally take charge of the students. There should be at least one such instructor to a group of five students—preferably to a group of three. The routine work should be attended to by the service physicians, who would, however, refer interesting cases to the chief of the clinic. It is easier to procure such paid instructors than to keep them. Many promising and properly trained young men are willing to accept such positions until their practice reaches a paying stage. After this stage is reached, it is difficult to retain them in the dispensary positions. This is one of the problems that must be faced in connection with dispensary instruction, and it would seem that we must either pay such instructors for their full time, or hold out to them the promise of promotion either in the dispensary itself or in the hospital.

The particular stage at which students are best put into dispensary work will perhaps depend to some extent on local conditions. In a school where the clinical clerk system is in operation and where, therefore, the student's fourth year work in medicine, surgery, pediatrics and diseases of women is adequately cared for in the hospital, it would seem as though the best disposition is to let the third year students devote their time in the dispensary to the general clinics and require the fourth year students, who obtain their general work in the hospital, to devote their dispensary period to the specialties. This can be satisfactorily done, however, only when great care is taken that the third year student shall receive adequate supervised instruction in his dispensary work so that he does not carry slipshod methods into his fourth year.

So far as the separate clinics themselves are concerned, in their relation to teaching, specialization should be encouraged. This will naturally be most feasible in the large city, much less so in the small one. There would seem to be no question that a student receives better instruction from a man who is specializing in some subject in which he is particularly interested than he does from a teacher who is not so engaged. Of great importance is the contact of the student with the working representatives of the various social organizations, which are nowadays so frequently affiliated with dispensaries. The student can learn much about such subjects as prenatal care, infant welfare, the mentally defective, and other aspects of preventive and social medicine, through the representatives of these agencies.

In connection with the teaching work of the dispensary, it seems to the committee that there are certain subjects of fundamental importance that may be covered in dispensary work and certain special methods of value. The third year student should be taught how to take histories and how to handle patients in a tactful and humane manner. He should learn how to make a thorough routine physical examination, and should preferably carry out himself the necessary work in the clinical laboratory in connection with each of his patients. He should obtain instruction and practice in the use of such instruments as the thermometer, sphygmomanometer, ophthalmoscope, etc. He should take charge of his patient throughout all special examinations, thus learning to appreciate the necessity of such examinations, and should gain some insight into the interpretation of roentgenoscopic findings, serum reactions, and similar special tests.

Certain methods are of special value in the instruction of students as well as in the care of dispensary patients. It seems to us that the class method, originally advocated for groups of tuberculous patients, could be widely extended to great advantage. It would be distinctly beneficial not only to the patient but also to the student to have classes of cardiacs, of nephritics, diabetics, neurasthenics, and patients with stomach trouble and leg ulcers. It goes without saying that this method could be extended indefinitely and should serve to stimulate interest not only in the student but also in the instructor to whom the particular cases are assigned. The proper use of the social service department and the clinic secretaries is also of great value to the teacher and student as well as to the patient. By means of card indexes and follow-up systems in the hands of the social workers, patients can be studied with much greater regularity than was formerly the case, and groups of patients presenting similar lesions can be brought together at intervals for purposes of study and instruction.

The main conclusions of the committee may be summarized as follows:

1. The dispensary or outpatient department, as a means both for the study of disease and systematic instruction of students, has been greatly neglected.

2. This will continue to be the case until our dispensaries are adequately housed, adequately equipped and adequately manned.

3. The present overcrowded condition of most of our dispensaries results in slipshod methods on the part of the assistants, and tends to the acquisition of slipshod methods by the student. It makes it difficult to procure men of the right caliber in dispensary work.

4. There is an urgent need for the recognition of the importance of dispensary work by the profession, and a recognition of the importance of adequate endowments by the laity.

5. A properly equipped and adequately manned dispensary is one of the most important factors in clinical instruction.

William Pepper, M.D.,
Dean of the University of Pennsylvania, School of Medicine, Philadelphia.

Paul G. Woolley, M.D.,
Professor of Pathology, University of Cincinnati, College of Medicine.

George Blumer, M.D., Chairman.
Dean of Yale University, School of Medicine, New Haven, Conn.

Michigan October Report

Dr. B. D. Harison, secretary of the Michigan State Board of Registration in Medicine, reports the written examination held at Lansing, Oct. 12-14, 1915. The total number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 19, all of whom passed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1915)	81.2, 81.5
University of Illinois	(1915)	84.4
Detroit College of Medicine and Surgery	(1915)	78.7, 80.7
University of Michigan Medical School	(1895) 75.7; (1915)	85.5
University of Michigan Homeo. Med. School	(1915)	75.3, 79.4, 82, 83.4, 84.7, 85.5, 85.7.
University of Oregon	(1915)	81.1
University of Pennsylvania	(1912)	82.9
University of Vermont	(1915)	84.6
University of Toronto	(1913)	87.9
Western University	(1912)	82.7

Forty-four candidates were licensed through reciprocity from May 14 to Dec. 9, 1915. The following colleges were represented:

College	Year Grad.	Reciprocity with
George Washington University	(1912)	Iowa
Chicago College of Medicine and Surgery	(1911) (1912) (1913, 2) (1914)	Illinois; (1914) Penna.
Chicago Homeopathic Medical College	(1890)	Colorado
College of Physicians and Surgeons, Chicago	(1912)	Indiana
Northwestern University	(1912)	Illinois
University of Illinois	(1913, 3) (1914, 3)	Illinois
Medical College of Indiana	(1897)	Indiana
Drake University	(1908)	Iowa
State University of Iowa, College of Medicine	(1897)	Iowa
Hospital College of Med., Louisville	(1888) Minn.; (1906)	Mississippi
Kentucky School of Medicine	(1888)	Ohio
Maryland Medical College	(1912)	New Hamp.
University of Maryland	(1911)	Maryland
Harvard University	(1900)	Missouri
Tufts College Medical School	(1907, 2)	New York
University of Michigan Medical School	(1897)	Wisconsin
Marion-Sims College of Medicine	(1898)	Iowa
St. Louis University	(1913)	Missouri
Washington University	(1909)	Illinois
Cornell University	(1913)	New York
Eclectic Medical College, Cincinnati	(1914)	Ohio
Jefferson Medical College	(1913)	Penna.
Woman's Medical College of Philadelphia	(1908)	New York
Vanderbilt University	(1886) Illinois; (1914)	Tennessee
University of Vermont	(1913)	Vermont
Medical College of Virginia	(1904) Virginia; (1915)	N. Carolina
Milwaukee Medical College	(1912, 2)	Wisconsin
University of Naples	(1898) Tennessee; (1904)	Illinois

Book Notices

LABORATORY METHODS, WITH SPECIAL REFERENCE TO THE NEEDS OF THE GENERAL PRACTITIONER. By B. G. R. Williams, M.D., and E. G. C. Williams, M.D., with an Introduction by Victor C. Vaughan, M.D., LL.D., Professor of Hygiene, University of Michigan. Third Edition. Cloth. Price, $2.50. Pp. 214, with 43 illustrations. St. Louis: C. V. Mosby Company, 1915.

As this book is intended for the general practitioner, one would expect from it little more than a presentation of the simpler methods of detail. It is debatable, however, whether the authors, in their efforts at simplicity, have not been somewhat lax in their method of pointing out possible errors, both in technic and in interpretation, in the tests outlined. In these days the general worker should do, or should have done under his direction, the major portion of his routine laboratory work, instead of relying on distant laboratories, none of which are in a position properly to interpret the relationship of the laboratory findings to the clinical course of the case under investigation. Unfortunately, this is not the condition, as the general worker feels that he is not in a position to perform his routine tests to the best advantage. It is true that practically all the material contained in this book should be thoroughly known to the practitioner at the time of his graduation, yet much of it escapes his memory. He requires a book for daily use, the type of book depending on his need for reference. This book on laboratory methods should be of great service in enabling the practitioner to refresh his memory. The subject-matter is divided into eighteen chapters, each treating of a separate phase of laboratory work. The newer additions have been placed, unwisely it would seem, in an appendix rather than in the body of the book. The topics are presented in a clear and concise manner, the discussion being arranged with a view to simplicity rather than to detail. The work can be recommended to those who do not desire to go into great laboratory detail, but wish simply to have a guide to the technic of every-day laboratory practice. If, at the same time, a larger reference book is at hand for occasional consultation, the worker will be so much the better fortified.

A TEXT-BOOK OF NERVOUS DISEASES FOR STUDENTS AND PRACTICING PHYSICIANS. IN THIRTY LECTURES. By Robert Bing, Dozent for Neurology at the University of Basel. Authorized Translation by Charles L. Allen, M.D. Cloth. Price, $5. Pp. 481, with 111 illustrations. New York: Rebman Company, 1915.

This book is good but not very useful. It is good because it contains all the most important facts of our present neurologic knowledge. It is not very useful because its verbosity and lack of clear, concise statement will repel the student and general practitioner, for whom it was designed. The subject-matter is presented in the form of thirty lectures, not because lectures actually delivered form the basis of the work, but because, as the author says in his preface, "of the recollection that in my student days, the reading of textbooks in lecture form was to my fellow students and myself like an oasis in the midst of the tiresome work of preparing for examinations." The clinical lectures of such masters as Trousseau, Charcot, Kraepelin and the elder Flint were and are delightful and illuminating. Those of our author might also be could he have compassed the clarity and directness of statement, the graphic emphasis and the skilful exclusion of nonessentials attained by those writers. The following sentence, taken almost at random from Bing's textbook, was read to a group of third year medical students: "Along with cases impressing themselves by typical heredofamily occurrence in which transmission occurs chiefly through the mother, who herself, however, can remain free from the disease—I designate this last as "maternal metrapectic inheritance'—come also sporadic cases, namely, in the 'juvenile scapulohumeral type' (Erb) which we will consider more at length under the discussion of the special forms of dystrophy." No one seemed to think it much of an oasis.

While no gross errors, either of commission or omission, have been noted, in some respects the arrangement of the matter seems to be rather unpractical. For instance, facial paralysis is discussed as part of a lecture on diseases of the peripheral nerves; but with the description of the affection there is nothing on treatment. For this one must depend on the general directions for treatment of diseases of the peripheral nerves. There is nothing on prognosis and nothing on differential diagnosis. The article on trigeminal neuralgia is inadequate. One is given the impression that the author has simply condensed statements taken from many sources without discreet selection, without digestion, even without rumination.

There are some excellent things in the book. Dysfunction of the endocrine glands is well treated, the section on diseases of the cerebellum is quite satisfactory, and the article on anterior poliomyelitis decidedly good. Indeed, the subject-matter as a whole is quite up to standard. A really great little textbook on nervous diseases has not yet been written, probably cannot be written. If that of Bing could be rewritten by the right man it would be among the best.

The translator seems to have been burdened with a hyperconscientiousness which has driven him to put into English much of the involved construction of the German. Otherwise the translation is pretty well done, though oversights of the proofreader are rather frequent. For the prolix style the translator cannot be held accountable; but it seems a pity to bulk up to 481 pages what might have been said in 381.

A MANUAL OF PHARMACOLOGY. By Walter E. Dixon, F.R.S., Professor of Materia Medica and Pharmacology at King's College, London. Fourth Edition. Cloth. Price, $4.20 net. Pp. 467. New York: Longmans, Green & Co., 1915.

Only drugs which have gained an incontestable place in pharmacotherapeutics are taken up; mere pharmacologic curiosities receive no attention. Wherever possible, the group treatment of drugs has been so utilized that the necessity of dilating on the properties of special drugs has been largely obviated. The drugs are taken up essentially with relation to therapeutic considerations, based wherever possible on pharmacodynamic observations. The language is direct and somewhat pregnant, yet the observations are comprehensive enough to impress on the reader the subsidiary as well as the main actions of the drugs so that a well-balanced appreciation of therapeutic values is safeguarded. While not expansive, the discussion is far from being merely compendious; there are structural chemical formulas, diagrams and instructive tracings judiciously introduced to add interest. While the book will hardly serve as a reference work in pharmacology, the very plan of exclusion that has been followed makes the book a safe guide for students beginning pharmacotherapy. It is commendable that the author has slighted such matter as encourages a venturesome use of drugs. It is well from more than one standpoint for the student not to have such a diversity of material in his therapeutic workshop but that what he does possess is as well approved and substantial as that furnished in this book.

A PRACTICAL TREATISE ON INFANT FEEDING AND ALLIED TOPICS FOR PHYSICIANS AND STUDENTS. By Harry Lowenburg, A.M., M.D., Assistant Professor of Pediatrics, Medico-Chirurgical College of Philadelphia. Cloth. Price, $3 net. Pp. 392, with 94 illustrations. Philadelphia: F. A. Davis Company, 1916.

This book aims to present practical directions for the feeding of infants and the care of the mother, with relation to the nursing period. The author has adhered to the percentage idea "as furnishing a valuable method of thinking, and not as a 'conditio, sine qua non,' the idea being that individualization is the basic principle of successful infant feeding." Needless to state, the greatest stress is laid on breast feeding. The material on this subject is practical, but presented in a didactic manner. Separate chapters are devoted to spasmophilia, exudative diathesis, and pyloric obstruction. The chapter on the latter subject contains a note on the surgical treatment, by Dr. Deaver. The author has apparently attempted to make his work inclusive rather than critical. Possibly this may explain his reckless recommendation of various proprietaries, whose value apparently he judges by the advertising literature.

Miscellany

Industrial Hygiene

A report has just appeared of the first session of the Section on Industrial Hygiene at the Fourth Annual Safety Congress of the National Safety Council in Philadelphia in October. Among the papers read and discussed was one on "Systems of Health Supervision" by Dr. George M. Price, Director of the Joint Board of Sanitary Control, of the cloak and suit industry, of New York City. Dr. Price said that health supervision in the industries depends on the two principles of industrial justice and industrial efficiency. It should comprise sanitary supervision, industrial hygienic supervision, purely medical supervision, general hygienic supervision, and health insurance. Health supervision to be complete must include some system by which the worker who is more or less disabled is taken care of while disabled, while sick and while invalided. The three sources of health supervision are individual, industrial and state. The latter, he believed, we are not yet ready to accept in this country, as being too socialistic. Industrial supervision should be general for a particular industry and not simply by the individual plant. Such a state has been brought about in the cloak and suit industry, and its authority is embodied in the Joint Board of Sanitary Control made up of representatives of the unions of workers and of the employers, the two contributing equal shares to the expenses. Among other things, there are provisions for the physical examination of those coming into the industry, the care of those ill or disabled, those sent away for their own benefit, attention to eye and dental diseases, etc.

Dr. W. H. Clarke of the Norton Company, manufacturers of grinding wheels and grinding wheel machinery, gave the experience of his firm in the development of its department of health and sanitation since 1911, when the first systematic work was inaugurated, with 1,200 employees, to the present 2,000. This was not considered welfare work, but a business proposition, and it has ranked as equally important with other departments of the shop. Physical examination is made before men are hired. The objects of physical examination of employees are to prevent contagious diseases becoming established in the works, to prevent grossly defective men attempting work for which they are incapable, and to allow adjustments by transferring a slightly defective employee to work which is more suitable to his condition. Examinations consume from twelve to twenty minutes, unless in exceptional cases, and the primary examinations had not in their experience been proved later to be inadequate. Complete records are kept, and a follow-up system is employed.

Dr. Sidney A. McCurdy of the Youngstown Sheet and Tube Company discussed the "Results Accomplished" by medical supervision from the standpoints of the needs of the individual, of the industry and of organized society, both as to its economic and its humanitarian aspects. He cited instances of industries in which, after health supervision was provided, many less days were lost by men examined; one in which tuberculosis had been practically weeded out, their own plant, in which over a hundred cases of trachoma had been discovered and treated, and one in which it was shown that the number of new men hired was less, the old, trained men, being able to remain at work to a greater extent than before medical supervision had been instituted. Safety had been advanced to new possibilities, for the man who is physically able to do his work is a safer man for himself and his fellow workmen.

The importance which the subject of medical supervision in the industries is assuming is shown by the demand made at this early stage for a standardization of methods. Dr. J. W. Schereschewsky, of the Public Health Service, said there was need for standards in respect to personnel and equipment, and standards for practice. Under the first head were to be considered the employment of whole or part time plant physicians, clerical, nursing and other assistants, their functions, the space, construction and equipment of the relief department, etc. Under the second head would be put standards of physical examination, standards with respect to rejections, standards in regard to physical defects and diseases not implying rejection, with provisions for those substandard, standards of practice with regard to injuries, treatment in cases requiring medical relief, sanitation of industrial plants, health education of the plant personnel, systems of recording and compiling records, etc. If medical supervision is to fulfil its predestined function, these must all be considered, and provision made for their adoption. It has been predicted that sickness insurance must come in this country; it has already arrived in some European countries. Until it does, Schereschewsky believes that well-organized systems of mutual sickness insurance, such as already exist in some plants, should form a part of the department of medical relief.

In line with Dr. Schereschewsky's paper, Dr. Emory R. Hayhurst, director of the department of occupational diseases, Ohio State Board of Health, presented and explained a series of standard forms for recording medical data. A standardization of such data is desirable because of the general movement for state-wide sickness insurance, similar to that of accident insurance, for all who are gainfully employed; because legal action against employers on account of alleged industrial sickness is becoming more frequent; because juries and courts are becoming more and more inclined to consider the word "injury" in compensation laws as including occupational diseases, and because efficiency men and industrial economists are seriously considering the question of the health of workers.

Dr. Alice Hamilton of Hull House sounded an important note in the discussions of the meeting with a paper on "Some of the Objections to Health Supervision," including suggestions for caring for the physically unfit workmen. She said she was spokesman only for the workman, and presented objections raised by him. If they were based on mistaken ideas, then employers should try to clear up the mistake, because otherwise the opposition would undoubtedly grow, and the workingmen would combine against all such laws and go on taking chances under the old haphazard system. One objection of the workman is that the system of examining a man to find out whether he may get a job or hold one results in throwing out a lot of workmen who believe they have a number of years of good service in them, but who have been found to have some physical defect which the employer, insured under the workmen's compensation laws, believes increases his risk. The shifting of a man from a well-paid job to a less well-paid job, for physical reasons, is something to which he will not willingly agree, even though it is represented to him that it will prolong his life. He is willing to undergo examination for communicable diseases, or for especially hazardous work, or for the safety of the public, as in the case of railroad men; but he objects when the examination is carried out, as he believes, in the interest of the employer—to lessen his risk. He mistrusts the company physician, and believes examinations should be made by neutral, impartial physicians. The workmen believe that the examinations are an adjunct to the American speeding-up system. They are put through the sieve of physical fitness, those not passing being left unprovided for. They say this must not be done until workingmen in all trades are safeguarded, and some system of state insurance for invalidity and old age provided. The man who is thrown out must be provided for before a system is established which throws him out. To Dr. Hamilton these propositions did not seem unreasonable.

Schools of Healing and the Press

In this day when medical fads are multiplying like flies in the summer time, and there is so much contention as to whether the followers of such cults are practicing medicine or not practicing medicine, it is encouraging to note that the better newspapers are recognizing that *an education* is the first essential, whatever the "method" or "system" of healing. Says the *Times Republican*, Marshalltown, Iowa: "It is ridiculous to assert that a person who can scarcely read and write, without general information or learning of any kind,

is a fit person to hold the indorsement of the state as a practitioner of a learned profession, that a few weeks' training in any system makes him arbiter of life and death, diagnostician, anatomist, physiologist and master of the human machinery and its functions. . . . The requirements that began with the general practice law and have been strengthened since have resulted in great good. No profession has taken such forward strides as the medical profession within the past thirty years. Healing is the art most of all to be closely guarded against ignorance and fraud. . . . People ill and under the shadow are the most readily deceived by design or ignorance. We may not be able to entirely suppress the designing, but we can and should deny the ignorant the right to practice the learned professions."

Sale and Use of Poisons

M. I. Wilbert, in *Public Health Reports,* quotes a table of nearly fifty drugs and chemicals which cause death. The table was compiled by the registrar of births and deaths in England and Wales. Many of the products are in common use in this country and are easily obtained. Poisoning due to the ingestion of narcotic or hypnotic drugs, not usually classed as poisons, is not infrequent, and there is obvious need of legislation to safeguard the sale and distribution of such drugs in interstate commerce. The diversity of present existing laws regulating the manufacture and sale of poisonous drugs in various states sometimes causes great embarrassment to commerce in these articles. A practical national poison law would serve as a model to determine what is a poison, and would also, if based on authentic information, be an incentive to strong adherence to the provisions of such a law. Wilbert says that one of the inherent difficulties in connection with the study of drug abuse is lack of knowledge in regard to the nature and character of the drugs sold and used, and the distinguishing features of the harmful influences exerted by drugs and compounds that are now consumed in large quantities. Many states have recently enacted or amended laws regulating the sale and use of poisonous drugs. There is still a lack of uniformity which is highly desirable in such laws, and it has been suggested that much uniformity could best be secured by amendment of state laws. Wilbert says, however, that some recently enacted state laws demonstrate the impracticability of this. The way out of the difficulty, therefore, is a national law that would at least apply to the articles here considered in interstate commerce.

Epinephrin in Treatment of Cerebral By-Effects of Salvarsan

Sauphar gave an intravenous injection of 0.15 gm. neosalvarsan to a young soldier with chronic hydrocele and positive Wassermann. Prolonged sneezing followed, with lacrimation and conjunctival congestion. A week later a second injection of 0.2 gm. was given, and by night there was great motor restlessness, with total insomnia and next day severe headache. The third morning the temperature was over 104 F., the face puffy, breathing stertorous, with total relaxation of the muscles and watery vomiting, the patient not conscious of his surroundings. Under repeated doses of epinephrin, injected under the skin or into muscle, the patient was tided along for a few hours, and by the sixth hour he fell tranquilly asleep. Recovery followed, with no remembrance of that third day. It is a typical example of what Milian calls "salvarsan serous apoplexy," and treats by keeping the patient under the influence of epinephrin. With or without premonitory phenomena the patient falls into coma the third day after the injection of the drug and dies in a few hours. Necropsy reveals nothing but edema and congestion in the brain, without the least organic change. It seems to be, he says, a "nitritoid crisis of the brain," and epinephrin in doses from 1 to 3, 4 or 5 mg. induces such intense vasoconstriction that the serous apoplexy is arrested. Sauphar, in reporting his case (*Bulletins Société médicale des hôpitaux,* 1915, p. 1276), says that his patient would undoubtedly have succumbed if it had not been for the epinephrin.

Medicolegal

Death of Hemophiliac Due to Accident—Sound Physical Condition

(*Massachusetts Bonding & Insurance Co. vs. Duncan* (*Ky.*), *179 S. W. R. 472*)

The Court of Appeals of Kentucky affirms a judgment in favor of Mrs. Duncan for $2,500 for the death of her son 20 years of age, who was insured by the company against loss of life by accidental means. Five days before his death he carried a distance of some 60 feet two watermelons weighing 40 pounds each, carrying one under each arm and against his abdomen. He afterward told a physician that he slipped or fell and received a strain where the melons pressed against his abdomen, and he at once became ill. The reasons given by the company for resisting payment were that the death of the insured was not due to any personal injury effected by accidental means; that he was the victim of a spontaneous hemorrhage; that all his life he was in unsound physical condition, suffering from hemophilia; that this disease culminated in a spontaneous hemorrhage and was the sole cause of his death. In answering, in his application, the question whether he was in sound physical condition, he said that he was, and further represented that he was in good health. In answer to the question if within a year past he had a constitutional disease, he said "No." The court says that, on this branch of the case, the question came down to whether the condition described was equivalent to a disease. If so, there was a material misrepresentation of fact, for he answered that he had no disease. But when he answered that he was sound physically, it did not necessarily mean that he was as sound, or that his anatomy was as perfect, as the strongest, or even the average man. The question related only to his own condition measured by what it had been, and by the answer one naturally infers that he was sound as compared to his condition theretofore. In this particular it was for the jury to determine from the evidence whether he made truthful answers. The jury believed that his answers were truthful, and the court is of the opinion that the evidence sustained their verdict. The physician before referred to said that "Duncan was of a hemorrhagic diathesis; but that is a vulnerability, not a disease." One may be vulnerable to tuberculosis by an inherited predisposition, and still may never have it. One's skin may be thin, and in that way he may have an inherited vulnerability to sunburns, and yet keep free from them. In the same way, one may be vulnerable to hemorrhages, that is, by inheritance be more susceptible to them than others, yet he may never have a hemorrhage.

Liability for Assistant's Malpractice Not Covered by Insurance

(*Seay vs. Georgia Life Insurance Co.* (*Tenn.*), *179 S. W. R. 312*)

The Supreme Court of Tennessee affirms a decree in favor of the defendant company, which was sued on a physician's liability policy by Dr. Seay after he had paid a judgment for $1,000 and costs on account of an assistant having made a mistaken diagnosis and unsuccessfully treated an injured miner whom Dr. Seay was under contract to treat as a mine employee. The court says that when the miner was hurt in an accident Dr. Seay's office was notified, and the assistant referred to responded to the call, undertook to diagnose the injuries, and proceeded to treat them. In so doing the assistant acted under general directions, within the scope of his employment, but Dr. Seay appeared to have had no knowledge of the particular case, or at any rate he gave the patient no personal attention, not seeing him at the time. The diagnosis and treatment were left wholly to the assistant. The physician's liability policy sued on undertook to indemnify Dr. Seay "against loss from the liability imposed by law upon the assured for damages on account of bodily injuries or death suffered by any person or persons in consequence of an alleged error or mistake or malpractice by any assistant in the employ of assured while acting under the assured's instructions." The question determining liability

in this case was whether the assistant was "acting under the assured's instructions," within the meaning of the policy. It was contended that the assistant acted in the line of his employment and according to previous general instructions and the custom which prevailed under the contract between him and Dr. Seay. But the words "while acting under the assured's instructions" were certainly introduced to qualify the company's liability in some way. Should the court hold an assistant acting under general instructions or within the scope of his employment to be acting under the "assured's instructions," then the qualification attempted would entirely fail. Interpreted as Dr. Seay insisted it should be, the phrase would neither expand nor restrict the insurer's liability. It would be altogether meaningless. The court may not thus deny effect to the expressed language of the parties. Moreover, all insurance is somewhat personal in its nature, resting to a great extent on the reputation and character of the assured. In a physician's contract such as this one, experience and ability of the individual insured necessarily and largely enter into the consideration. The risk assumed is the assistant "while acting under the assured's instructions." As a safeguard against the error, mistake, or malpractice of the assistant, the insurer stipulates for the instructions of the assured. The insurer, relying on the professional skill of the assured, contracts for his supervision, or at least for his instructions. It cannot be held that the insurer by this sort of a contract undertakes to answer for the mistakes or malpractice of a physician's helper acting on his own responsibility without any advice or directions from the assured; such subordinate being unknown to the insurer, and the policy without provision as to his qualifications. This would be an extraordinary hazard, and not one within the purview of this policy. In this case the assistant diagnosed and treated the patient without suggestion or aid from Dr. Seay. From a professional standpoint the assistant was acting independently. The insurer had no benefit of the supervising skill or instructions of Dr. Seay for which it had contracted. Such supervision or instructions might have averted the mistaken diagnosis and the consequent malpractice. The court is satisfied that the assistant was not "acting under the assured's instructions," within the meaning of this policy.

Immaterial Questions as to Treatment—Reading from Medical Works

(Osborn vs. Cary (Idaho), 152 Pac. R. 473)

The Supreme Court of Idaho affirms a judgment in favor of the defendant on the second appearance before it of this case, wherein it was sought to recover damages for alleged malpractice in diagnosing and treating osteomyelitis of the tibia of the right leg as septicemia, while the defendant contended that he correctly diagnosed the disease to be septicemia and administered the proper treatment therefor. The court holds that objections were properly sustained to certain questions propounded to expert witnesses, asking what the effect would have been if the treatment administered as described had been continued without further or different treatment, and what treatment a reasonably skilful physician would have attempted. These questions were objectionable because one of the hypothetic questions therein referred to assumed that during the entire period of the treatment the patient was suffering from and being treated for osteomyelitis, while the testimony of the defendant showed that he diagnosed and treated the ailment as septicemia; and, since the treatment for septicemia was not continued, it did not appear to be material what the result of its continuance would have been, nor did it appear to be material what the correct treatment for osteomyelitis was, since the defendant testified that he did not administer that treatment. On the other hand, there was no error in counsel for the defendant being permitted, in the cross-examination of certain of the plaintiff's expert witnesses, to read from a medical and surgical textbook which was admitted by the witness to be a standard authority on the subject about which they were testifying, excerpts being read from the book and it being passed to the witnesses, and they being asked whether they agreed or disagreed with it. While it is the general rule that books on scientific subjects are not admissible in evidence, except after after an expert witness has referred to a particular work to sustain his opinion, in which case only such work may be admitted to contradict him in that opinion, it is also a well-established rule that, when a witness is testifying as an expert, it is competent to test his knowledge and accuracy on cross-examination by reading to him or having him read extracts from standard authorities on the subject of his examination and by asking him whether he agrees or disagrees with them. This is in no sense the introduction of the contents of the books in evidence.

Affidavits and Diplomas Not Conclusive on State Board of Medical Examiners

(Stretch et al. vs. State Board of Medical Examiners (N. J.), 95 Atl. R. 623)

The Supreme Court of New Jersey holds that the evidence before it did not entitle the relators, as it calls them, to a writ of mandamus to compel the board to grant them licenses to practice osteopathy. The court says that it was conceded that the relators submitted in due course affidavits stating the required particulars, and that each submitted also a paper purporting to be a diploma from a college of osteopathy, which was claimed to be an institution complying with the state statute. The court did not find any testimony directed specifically to the question whether the relators were "graduates" in the real sense of the word as distinguished from mere holders of diplomas or certificates. Their claim was that the affidavit and diploma were conclusive, and that whatever be the actual facts, the state board is required to license an applicant on receipt of these papers in proper form. The court agrees with them that the statute is mandatory on the board; but its mandate depends on the actual existence of a state of facts, and neither on a representation of those facts in certain documents nor on the opinion or judgment of the board as to what those facts are. It is hardly conceivable that the legislature intended to license, as practitioners of a healing profession, any and all who should lodge certain papers with the state board, irrespective of the truth or falsity of those papers. Still the court cannot agree with the contention that the board is the judge of the facts. The court concedes this to be generally true in cases of this kind, but it thinks it will be found that they turn on the language of some statute which, expressly or by plain implication, designated the board as judge of the facts. The New Jersey statute in question is not of that class. The board, on receipt of papers in proper form, is, as the court thinks, required to pass, in the first instance, on the facts therein claimed. It may be satisfied of their truth, in which case its duty is to license. It may not be so satisfied, in which case its duty is to make reasonably prompt investigation and satisfy itself one way or the other. If its conclusion be adverse to the applicant, such applicant is not himself concluded thereby, but is entitled to have the fact ascertained judicially, and, if settled in his favor, to his license notwithstanding the prior adverse conclusion of the board. Such judicial ascertainment would, of course, be in a mandamus proceeding. However, the court doubts the propriety of embracing these four relators in one rule or in one writ. Their rights are separate and distinct, and depend on different states of facts similar only in their nature.

Placing and Keeping Patient on Hot-Water Bag

(Grosshart et al. vs. Shaffer (Okla.), 152 Pac. R. 441)

The Supreme Court of Oklahoma affirms a judgment for $2,500 damages in favor of plaintiff Shaffer against defendant Grosshart, a physician, and a sanatorium or hospital. The court says that the plaintiff employed Dr. Grosshart to perform an operation for hernia. The latter testified, in substance, that when he had about completed the operation he concluded from certain indications that the patient was about to go into a state of collapse; that, so believing, he called to a young woman who had formerly worked in the hospital, but who was no longer in its employ, and asked her to prepare the bed and room for a patient in collapse; that this prepara-

tion required as much heat as could be reasonably obtained, and included heating the bed with hot-water bottles; that he then picked the patient up in his arms and carried him to the room and laid him in the bed, and incidentally on a rubber bag full of very hot water. Other proof showed that the patient in his unconscious condition lay there a very short time, evidently until the bottle began to burn his body, when he aroused and in returning to consciousness showed signs of great agony, crying out aloud that he was "burning up," that his back was burning, and that his exertion became so violent that it took four or five people to hold him in the bed and on the bottle, and they did hold him there for quite a length of time. Finally they turned him over on his side, which probably accounted for the wound found there. Then a bystander, a friend of the patient, offered the suggestion that there might be something in the bed, and one of the nurses pulled the hot-water bottle from under the man and held it behind her and took it out of the room. Laying aside the question of agency, and whether or not the physician was responsible for the acts of the attendants, he was certainly responsible for his own acts, which consisted in directions that included the placing of the hot-water bottles where they were. He placed the man in the bed himself. The evidence showed that he saw at least a portion of the struggles the man made, and the unusual effort it required to hold him down, and heard the cries the man made that his "back was being burned." It seems to the court that, under this situation, if the physician had been exercising that care and solicitude for the welfare of his unconscious patient which the law required and the dictates of humanity would suggest, he would have associated the idea of the hot-water bottle he had directed to be placed in the bed with the man's suffering, and his unusual and violent struggles, together with his statements as to burning. The court does not mean to condemn the physician, or even to say that he was in fact negligent, and it appreciates his point of view, which evidently was that the nurse had removed the hot-water bottles to one side, and that the patient's struggles were but unusually severe manifestations of the usual phenomena observed when patients are coming from under an anesthetic, and that, so believing, he permitted the patient to be held on the bed, causing his injury. What the court does say is that, taking the situation as it finds it, and as the jury observed it, there was ample evidence to justify them in finding that the physician had not exercised proper care. There was no contention that the judgment against the sanatorium was not warranted. Nor could it be said that the judgment was excessive.

Privilege and Waiver

(*Michaels vs. Harvey et al. (Mo.), 179 S. W. R. 735*)

The Kansas City Court of Appeals holds, in this personal injury case, that the evidence sufficiently disclosed that the confidential relation of physician and patient was established and existed between a physician and the plaintiff during an examination made by the physician, where he was called by a hunter of damage suits, but stated that he thought he was summoned at the patient's request and made the examination as her physician for the purpose of treating her, while she denied that either she or any one authorized by her had authorized the man, whom she referred to as "a friend of ours," to employ a physician, but accepted his services on that occasion. The fact that the examination occurred during the existence of a confidential relationship between the witness and the plaintiff was essential to the creation of the privilege invoked by her under the statute. Regarding that fact as established, the resultant privilege must be conceded. But it was waived by the plaintiff when by her own testimony and that of her other physicians she disclosed all secrets concerning the consequences to her of the physical injury she received at the hands of the defendants. It was immaterial that the physicians were not employed at the same time, but examined the plaintiff on different days. The subject-matter of the two examinations being the same, the waiver of the privilege as to one waived it as to the other. But the court does not think that it was erroneous to refuse to allow the regular physician of the defendants to testify, where he was not employed by the plaintiff, and stated that he was suffered to make an examination of her pursuant to an attempt to compromise or settle her claim against the defendants. To permit him to disclose the knowledge of her condition obtained in this manner would be violative of the rules designed to encourage the compromise and settlement out of court of disputed claims and rights.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, DETROIT, JUNE 12-16.

Alabama State Medical Association, Mobile, April 18.
American Assn. of Genito-Urinary Surgs., Washington, D. C., May 9-10.
American Association of Path. and Bact., Washington, D. C., May 9-11.
American Climatological and Clin. Assn., Washington, D. C., May 9-11.
American Dermatological Association, Washington, D. C., May 8-10.
American Gastro-Enterological Association, Washington, D. C., May 8-9.
American Gynecological Society, Washington, D. C., May 9-11.
American Laryngological Association, Washington, D. C., May 9-11.
Amer. Laryn., Rhin. and Otol., White Sulphur Sprgs., W. Va., May 3-6.
American Ophthalmological Society, Washington, D. C., May 9-11.
American Orthopedic Association, Washington, D. C., May 8-11.
American Otological Society, Washington, D. C., May 9-10.
American Pediatric Society, Washington, D. C., May 8-10.
American Society of Tropical Medicine, Washington, D. C., May 9-11.
American Surgical Association, Washington, D. C., May 9-11.
American Urological Association, St. Louis, April 17-19.
Arizona Medical Association, Phoenix, April 26-27.
Arkansas Medical Society, Texarkana, May 2-4.
Association of American Physicians, Washington, D. C., May 9-11.
California State Medical Society, Fresno, April 18-20.
Conference of State and Prov. Boards of N. A., Washington, May 16-17.
Cong. Am. Phys. and Surgs. of No. Am., Washington, D. C., May 9-10.
Connecticut State Medical Society, Bridgeport, May 17-18.
Florida Medical Association, Arcadia, May 10-12.
Georgia Medical Association, Columbus, April 19-21.
Illinois State Medical Society, Champaign, May 16-18.
Iowa State Medical Society, Davenport, May 10-12.
Kansas Medical Society, Topeka, May 3-5.
Louisiana State Medical Society, New Orleans, April 18-20.
Mississippi State Medical Association, Greenville, May 9-11.
Missouri State Medical Association, Excelsior Springs, May 8-10.
National Assn. for Study and Prev. of Tuberc., Wash., D. C., May 11-12.
Nebraska State Medical Association, Omaha, May 23-25.
New Hampshire Medical Society, Concord, May 16.
New York State Medical Society, Saratoga Springs, May 16.
North Carolina State Medical Society, Durham, April 18.
North Dakota State Medical Association, Devils Lake, May 10-11.
Ohio State Medical Association, Cleveland, May 17-19.
Oklahoma State Medical Association, Oklahoma City, May 9-11.
South Carolina Medical Association, Charleston, April 18-20.
South Dakota State Medical Association, Aberdeen, May 23-25.
Texas State Medical Association, Galveston, May 9-11.
West Virginia State Medical Association, Wheeling, May 16-18.

PHILADELPHIA COUNTY MEDICAL SOCIETY

Meeting held Feb. 23, 1916

The President, DR. JOHN D. MCLEAN, in the Chair

Eye Phenomena in Pulmonary Tuberculosis

DR. LUTHER C. PETER: In a study of 320 cases of pulmonary tuberculosis, two groups of eye phenomena were observed: (1) those due directly to tuberculous processes, and (2) those occurring coincidently with tuberculous processes. In all the cases examined, those in which the fundus could be seen by the ophthalmoscope, venous engorgement was marked; a low grade neuroretinitis was present in thirty-four cases; retinal haze in seventeen; posterior uveitis in seven, and old phlyctenular scars in three cases. The fundus phenomenon observed was more or less in direct relation to the stage of the disease, that is, well advanced or moribund cases showed a greater degree of engorgement of a neuroretinitis. One case showed a papilledema. These phenomena depict the circulatory conditions existing throughout the body. Second in importance was the absence of active phlyctenular processes. This is in accord with the generally accepted view that phlyctenulosis does not occur in adult pulmonary active tuberculosis. In children, however, the condition may be present, even during the active process. As a rule, phlycten-

ules indicate either a pretuberculous stage of the disease in a child who is not immune, or a posttuberculous stage in which the smoldering embers of tuberculosis may again be lighted up sufficiently to produce a toxemia without exciting an active tuberculosis. The third interesting fact is the total absence of tubercles along the uveal tract. A fourth phenomenon is the width of the palpebral fissure and the lagging behind of the upper eyelids, known as von Graefe's sign in exophthalmic goiter. This is due to absorption of the orbicular fat, and the lack of tone of the levator and orbicular muscles. It may be found in any case of extreme emaciation. Care was observed in the study of these cases to exclude all chronic conditions or other pathologic factors, such as syphilis, diabetes and chronic nephritis.

The Specific Roentgen Markings Characteristic of Pulmonary Tuberculosis

DR. KENNON DUNHAM, Cincinnati: There are definite markings on the Roentgen plates characteristic of pulmonary tuberculosis. In almost 3,000 carefully examined cases I have been unable to find any other disease which gives these characteristic markings. By the means of the stereoroentgenogram a diagnosis of tuberculosis can be made before the clinician can obtain positive signs. From the markings it is not always possible to distinguish the difference between an active and a healed lesion. In point of time the earliest diagnosis can be made by the roentgenologist, but if a carefully taken history is depended on, the earliest guess can be made by the clinician. Such a guess, however, applies to glandular tuberculosis, and is not correct as to pulmonary tuberculosis. The most accurate diagnosis of pulmonary lesions is obtained when *all* methods are used carefully, skilfully and intelligently. While we may be sure of a negative diagnosis by the Roentgen findings, we cannot always be certain that a slight lesion is or is not active. The Roentgen findings characteristic of pulmonary tuberculosis consist of numerous abnormal changes limited to the linear markings of the various trunks. These abnormal densities reach the periphery and are more or less fan-shaped, with the apex or the angle of the fan toward the hilum. These densities are not homogeneous, but each trunk has a distinct characteristic marking. A plate having a homogeneous distribution of its markings is probably not tuberculous. Each fan-shape density is connected to the hilum with a heavy trunk. The character of density causing these triangular changes limited to the linear markings vary greatly in character. As the lesion progresses the alterations become more marked until eventually all the markings are blotted out and there may be an appearance of a unified mass of increased density. The change in lung density is due primarily to tubercles scattered along the bronchial tree to the periphery, that is, to the pleura. To obtain the markings of an individual chest, all that is necessary is to have the roentgenologist take a pair of accurate stereoscopic plates, which should be examined in a stereoscope as carefully as is a microscopic slide.

Clinical Diagnosis of Incipient Pulmonary Tuberculosis

DR. H. R. M. LANDIS: Of the diagnostic methods, the bacteriologic, the tuberculin test and the Roentgen ray are to be looked on as valuable aids; but they do not furnish conclusive evidence of the presence or absence of incipient tuberculosis. At present our main reliance is on the clinical method. From the clinical standpoint the diagnosis presupposes a familiarity with the morbid anatomy of the disease, a clear conception of the significance of the commonly associated symptoms, the ability to elicit and interpret the physical signs, and a knowledge of the limitations of other diagnostic aids. Mistakes in diagnosis would be far less frequent were it remembered that the disease invariably manifests itself first at or near one of the apices. From the history alone the vast majority of cases of early tuberculosis can be recognized, or the presence of the disease strongly suspected. The mathematical chances of tuberculosis being present are overwhelming in any person who has a hemoptysis, an attack of pleurisy, a fistula in ano, or transient attacks of slight hoarseness, notwithstanding previous good health and excellent physical condition. Unfortunately the onset of tuberculosis is far more often insidious. In the bacteriologic diagnosis, absence of tubercle bacilli is not proof positive of the absence of the disease; probably 75 per cent. of true incipient cases are closed. In all cases of pulmonary disease the sputum should be examined for organisms other than tubercle bacilli. The tuberculin test has been almost entirely abandoned because it is not free from danger, there being many instances in which a quiescent lesion has been made active, and because the method does not distinguish between the lesion which is arrested and the one which is about to become active, or is active. There are no physical signs peculiar to a tuberculous deposit in the lungs. It is rather in their combinations, situation, successive changes and connection with symptoms that they have their value. Physical signs localized at the bases of the lungs can practically always be eliminated as indications of incipient tuberculosis. Limited, however, to one or both apices and associated with symptoms we have almost certainly to deal with a tuberculous process. Errors in diagnosis may arise from failure to observe the location and nature of the morbid process. I believe that incipient tuberculosis can be recognized in the vast majority of cases by ordinary clinical methods. In a small proportion of doubtful cases the Roentgen rays may be used to confirm or disprove the presence of a lesion. I have seen a few in which the roentgenologist made the diagnosis when the clinical method had failed; also, cases in which subsequent events or necropsy showed the roentgenologist to have been wrong. In the hands of one who has a good technic, a knowledge of the morbid processes invading the lung, and the experience to interpret the plates properly, a correct diagnosis can be made in the majority of cases by means of the stereoscopic plates. The method fails, however, just as does the clinical, in the hands of the unskilled. Furthermore, the proof is as yet forthcoming that the roentgenologist can differentiate the lung shadows due to a tuberculous infection and those due to other pathologic states; nor can he distinguish between an active and a healed tuberculous lesion.

DISCUSSION

DR. JUDSON DALAND: A large element in the failure of early diagnosis of pulmonary tuberculosis is the neglect to consider conjointly the physical and clinical signs. A tuberculous lesion extending to the second rib marks in most instances a well advanced case. The average practitioner is inclined to regard such a case as one of early tuberculosis. The occurrence of hemorrhage in an apparently healthy person, the positive findings in the sputum and the study of conditions other than the presence of the tubercle bacillus do not receive serious consideration. One of the most important factors in early diagnosis is the development of an individual technic in our physical examinations. The accuracy of the Roentgen ray in examination makes for it an important place in the diagnosis of the more obscure cases of pulmonary tuberculosis.

DR. WILLIS F. MANGES: The roentgenogram is ocular evidence that precludes the possibility of a tuberculous lesion being overlooked. We must not, of course, separate it from clinical findings, history and symptoms; but it has been our experience time and time again to show the clinician that the lesion was much more extensive than indicated by the clinical evidence. I am not satisfied that the Roentgen ray gives positive evidence of the very earliest symptom-producing tuberculous infection. I have been holding to the belief that a tuberculous process producing symptoms should show some more or less characteristic density in the lung tissue that was not merely a veiling or shadowy film, but a localized density. I have not attempted to interpret such shadows.

DR. HENRY K. PANCOAST: The Roentgen diagnosis of pulmonary tuberculosis is at present in the developmental stage. The single plate is absolutely useless and is apt to be misleading. The stereoscopic plate combined with the fluoroscopic examination is the only method of value. The study of the subject should be carried on by the roentgenologist in connection with the clinician.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

March, LXXIII, No. 3, pp. 385-576

1 *Education, Licensing and Supervision of Midwife. J. C. Edgar, New York.
2 *Is Midwife Necessity? J. M. Baldy, Philadelphia.
3 *Progress Toward Ideal Obstetrics. J. B. DeLee, Chicago.
4 Prenatal Problem and Influence Which May Favorably Affect This Period of Child's Growth. M. West, Washington, D. C.
5 Delivery by Natural Passages Following Cesarean Section; Report of Two Cases. J. T. Williams, Boston.
6 Technic at Jewish Maternity Hospital and Its Results. J. Walker, Philadelphia.
7 End-Results of Resection of Ovaries for Microcystic Disease. J. A. McGlinn, Philadelphia.
8 Morphin and Scopolamin in Gynecologic Surgery. W. F. Morrison, Philadelphia.
9 *Etiology of Appendicitis. C. Chase, Brooklyn.
10 Clinical Importance of Unilateral Fused Kidney (Including Distopic Kidney of One Side). A. Stein, New York.
11 Twin Pregnancy in Horn of Bicornuate Uterus With Retention of Fetuses for Twenty Years. E. Scott and J. Forman, Columbus, Ohio.
12 *Morphography of Two Hundred and Eighty-Five Colons. J. E. Davis, Detroit.
13 *Treatment of Pertussis. I. L. Polozker, Detroit.
14 Teething as Diagnosis for Many Ills. J. Epstein, New York.

1, 2 and 3.—Abstracted in THE JOURNAL, January 1, pp. 55 and 56.

9. **Etiology of Appendicitis.**—Chase emphasizes the importance of hematogenous infection as a cause of appendicitis. He raises the question of the possible prophylactic treatment of appendicitis by removing all discoverable foci of infection and by the early treatment of all acute infections.

12. **Morphography of Colons.**—This study was made by Davis to determine the relative positions of the colonic segments, the nature of the usual angulations, the frequency of undeveloped parts, and the extent of deviated morphology consistent with adequate physiologic function. The material used consisted in bodies embalmed with formol, phenol and glycerin compound in preparation for dissecting purposes. There were approximately 32.5 per cent. of the colons with normal morphography. In 9.9 per cent. of all cases there were persisting embryologic forms. In 0.9 per cent. there was incomplete rotation of the colon, and in 1.4 per cent. there was incomplete descent of the cecum. The transverse segment of the colon had descended to some point between the umbilicus and the pubes in 15.5 per cent. of all cases. In 17.8 per cent. of the subjects there were abnormalities of the pelvic colons. There were diverticulae in 0.9 per cent., gigantism in 0.9 per cent. and marked constrictions in 2.3 per cent. of the colons. Adhesions were observed at the hepatic flexure in 5.8 per cent., at the gastric area in 4.2 per cent., and at the ileocecal region in 7.5 per cent. of the subjects. There were distinct enlargements of the colons proximal to constricted splenic flexures with evident reasons for delayed motility, in 8.4 per cent. of the series. In 4.3 per cent. of the pelvic colons there was no angulation, only a slight curving being evident from the midportion of the descending segment to the rectal tube.

There were convincing evidences of etiologic conditions for constipation in 55 per cent. of the subjects. Two cases (or 0.6 per cent.) of herniated cecums were found. In 1.2 per cent. of the cecums they were fishtail in shape and in 20.7 per cent. decidedly pouched in form. The ascending colon was found in oblique positions in 13.7 per cent., and in horizontal positions in 0.6 per cent. of subjects. The average length of this segment was one sixth of the entire colon, approximately 10 inches. The hepatic flexure appeared in distinct coil forms in 0.9 per cent., and in very acute angulation in 21 per cent. and was absent or presented only a slight convexity toward the liver in 7.8 per cent. of the subjects. The transverse colon was found low in the pelvis in 4.9 per cent. and a marked ptosis in 23.4 per cent. The splenic flexure was absent in 4.2 per cent., coiled in 1.2 per cent., and of a clothes-pin form in 2.1 per cent. The descending colon was found to be coiled, between the splenic flexure and the pelvic brim, in 4.2 per cent. of the series. The pelvic colon was almost straight in 16.8 per cent. of the cases, was acutely angulated in 16 per cent., coiled and agglutinated in 3.1 per cent. and appeared well over on the right side in 2.4 per cent.

13. **Treatment of Pertussis.**—Polozker reports on 100 cases in which various forms of treatment were tried. It mattered very little what the medication was, the disease ran its usual course. Polozker's experience with vaccine has impressed him with its value and he says he will continue its use in the future.

Arkansas Medical Society Journal, Little Rock

March, XII, No. 10, pp. 243-266

15 Congenital Malaria. H. Thibault, Scott.
16 Rational Therapeutics. T. Douglass, Ozark.
17 Uncinariasis. S. J. McGraw, El Dorado.
18 Surgical Treatment of Placenta Praevia. E. L. Beck, Texarkana.

Boston Medical and Surgical Journal

March 23, CLXXIV, No. 12, pp. 407-440

19 Some Present Day Problems in Surgery. M. F. Fallon, Worcester.
20 Carnivorous and Herbivorous Types in Man. J. Bryant, Boston.
21 R'Aaison D'Etre of Term "Involutional" as Applied to Melancholia. J. W. Courtney, Boston.
22 Bacteriologic Work at American Ambulance. O. F. Rogers, Jr., and G. Benet, Boston.
23 Nine Cases of Spinabifida. B. B. Cates, Knoxville, Tenn.
24 Recent Epidemic of Influenza in Boston. J. A. Ceconi, Boston.
25 Analysis of Fourteen Cases of Diabetes Mellitus Unsuccessfully Treated by Fasting. E. P. Joslin, F. G. Brigham and A. A. Hornor, Boston.
26 *Simple Method of Obtaining Ragweed Pollen in Large Quantities. R. P. Wodehouse, Cambridge.

26. **Method of Obtaining Ragweed Pollen in Large Quantities.**—Wodehouse strips the flower heads from young plants, just coming into bloom, and after being allowed to become almost dry, these are crushed in a mortar with several volumes of carbontetrachlorid. After thoroughly macerating, the liquid is strained off through muslin. Most of the pollen, liberated by crushing from the anthers, passes with the CCl_4 through the muslin and can be collected on filter paper and be washed with fresh CCl_4, or with the same, after filtering out the pollen, to remove what pollen remains after the first washing. The CCl_4 can be used several times, or until it becomes impregnated with oils, etc., when it should be replaced or distilled to remove the impurities.

California State Journal of Medicine, San Francisco

March, XIV, No. 3, pp. 85-126

27 General Oversight and Filing of Records. G. L. Clark, San Francisco.
28 Case Recording. H. D. Power, San Francisco.
29 Study in Handicaps. F. Grazer and F. F. Gundrum, Sacramento.
30 Department of Psychology in Los Angeles City Schools. Study of Mentally Different. L. B. Bennett, Los Angeles.
31 Concretions of Spleen. B. Jablons, San Francisco.
32 Leukopenia; Its Relation to Neuralgia. J. H. Catton, San Francisco.
33 Typhoid Death Rate in California. W. A. Sawyer, Berkeley.
34 Oral Hygiene; Care of Mouth During Illness. J. S. Marshall, Berkeley.
35 Complete Removal of Parotid Gland Without Injury to Facial Nerve. J. H. Barbat, San Francisco.

Canadian Medical Association Journal, Toronto

March, VI, No. 3, pp. 193-288

36 *Acupuncture Best Method of Vaccination Against Smallpox. H. W. Hill, London.
37 Eyestrain. E. T. Easton, Boston.
38 Science and Medicine. H. Oertel, Montreal.
39 Method of Examination and Results in Sight, Hearing and Color Vision for One Year on Grand Trunk Railway System. H. B. Carmichael, Montreal.
40 Pellagra. L. G. Pinault, Campbellton, New Brunswick.
41 Ruptured Tubal Pregnancy. H. M. Torrington, Sudbury.
42 Unusual Case of Eclampsia. D. J. Evans, Montreal.

36. **Acupuncture Best Method of Vaccination Against Smallpox.**—Hill describes this method as follows: The arm is washed with soap and water, then with alcohol and finally

with ether. A small drop of vaccine is deposited on the clean surface. The vaccinator's hand is closed on the arm from behind so as to draw the skin tight in front, and the sewing needle point, held slantingly nearly parallel with the skin, is pressed against the skin through the drop of vaccine. Then it is that one one-thousandth of an inch of the point sticks through the upper layer of the skin, carrying the vaccine with it. The needle is instantly withdrawn and another puncture exactly like the first is made close beside it, until six punctures are made in the space of 1/16 of a square inch or less. The whole process of puncture takes perhaps fifteen seconds. At once with a bit of sterile gauze, the surface vaccine is removed, and the sleeve drawn down.

Cleveland Medical Journal

February, XV, No. 2, pp. 83-156

43 Treatment of Extra-Uterine Pregnancy. A. P. Heineck, Chicago.
44 *Ptomain Poisoning from "Creamed" Codfish. M. A. Blankenhorn, G. E. Harmon and P. J. Hanzlik, Cleveland.
45 Case of Essential Hematuria. S. Englander, Cleveland.
46 Recent Advances in Gynecology and Obstetrics. W. D. Fullerton, Cleveland.
47 Clinical Laboratory Methods. C. L. Cummer, Cleveland.
48 Neurologic Reviews. T. S. Keyser, Cleveland.

44. **Ptomain Poisoning from "Creamed" Codfish.**—The clinical symptoms observed in a large number of patients attacked with ptomain poisoning from "creamed" salted codfish were: epigastric distress, nausea, vomiting, intestinal colic and diarrhea. Complete recovery occurred in twelve to twenty-four hours, in a part of the individuals spontaneously, and in another part, following gastric lavage. Bacteriologic examination of the "creamed" fish showed the presence of *Bacillus coli communior,* and other saprophytes and some staphylococci. The gastro-intestinal disturbances are not attributed by the authors to infection by the organisms in the fish material. Extracts of the "creamed" fish gave practically the same physiologic reactions as the same brand of salted codfish which was previously allowed to putrefy and then prepared in the same manner as the food served to the patients. The physiologic effects consisted of a marked stimulation of intestinal and uterine peristalsis in surviving organs; and a fall of blood pressure with gradual recovery. The purified active extract of the "creamed" putrefied salted codfish contained some physiologically active base, whose chemical reactions resemble those of the group of diamins to which putrescin, cadaverin and histamin belong.

Colorado Medicine, Denver

March, XIII, No. 3, pp. 69-102

49 Subphrenic Abscess. J. N. Hall, Denver.
50 Operative Treatment of Fractures. M. E. Preston, Denver.
51 Scopolamin Amnesia, or Twilight Sleep. C. A. Ferris, Denver.
52 Case of Akromegaly With Mediastinal Tumor. J. Inglis, Denver.
53 Functional Result of Astragalectomy in Infantile Paralysis. R. G. Packard, Denver.

Georgia Medical Association Journal, Augusta

March, V, No. 11, pp. 153-177

54 *New Treatment for Burns. H. R. Slack, LaGrange.
55 Relation of Mammary Glands to Nervousness and Menstruation. E. B. Block, Atlanta.
56 Uses of Salicylate of Soda in Treatment of Disease. B. P. Oliveros, Savannah.
57 Dammerschlaf, or Twilight Sleep. I. H. Adams, Macon.
58 Treatment of Gonorrhea and Complications From Standpoint of General Practitioner. J. C. Weaver, Atlanta.
59 Landry's Paralysis; Report of Case. H. Crenshaw, Atlanta.
60 Contract Work With Life Insurance Companies for Less Than Five Dollars for Each Examination by Members of Medical Societies. M. L. Currie, Vidalia.
61 Anterior Poliomyelitis; Treatment of Infantile Paralysis. H. M. Michel, Augusta.

54. **Treatment of Burns.**—Slack holds that the immediate application of tincture of ferric chlorid is the best treatment for burns. Paint the entire surface over with ferric chlorid several times with cotton applicator, or camel's hair pencil, being careful not to break the blisters in the second degree burns, or to remove the charred surface in the third degree. Then apply dry gauze dressing. The first impression is of increased pain, but continue the application and it soon ceases. Whenever it becomes severe reapply the tincture of iron. Slack says this treatment is original with him and that he has been using it for over twenty years.

Journal of Cutaneous Diseases, Boston

March, XXXIV, No. 3, pp. 159-258

62 *Sugar Content of Blood in Various Diseases of Skin. H. J. Schwartz, W. J. Heimann and H. C. Mahnken, New York.
63 Complement Fixation in Acne Vulgaris. A. Strickler, J. A. Kolmer and J. F. Schamberg, Philadelphia.
64 Value of Various Diagnostic Methods for Cerebrospinal Fluid. H. Nakano, Tokyo.
65 Dermatitis Repens; Report of Two Rare Cases. H. J. F. Wallhauser, Newark, N. J.
66 Modern Treatment of Burns. G. de Tarnowsky, Chicago.
67 Rhinoscleroma; Report of Case. H. E. Alderson, San Francisco.
68 Case of Postvaccinal Psoriasis. J. E. Lane, New Haven, Conn.

62. **Sugar Content of Blood.**—Sixty cases of acne, seborrhea and sycosis were studied by the authors of which twenty-six showed excessive blood sugar and only twenty-four a normal amount, the remaining ten being on the border line.

Journal of Nervous and Mental Disease, Lancaster, Pa.

March, XLIII, No. 3, pp. 201-296

69 *Comparison of Mental Symptoms Found in Cases of General Paresis With and Without Coarse Brain Atrophy. E. E. Southard, Boston.
70 *Histologic Study of Optic Nerves in Insane Cases. M. M. Canavan, Boston.
71 *Rôle of Hallucinations in Psychoses. F. M. Harrison, Washington, D. C.

69. **Comparison of Mental Symptoms.**—A group of thirty-eight general paretics whose brains were specially examined by Southard, has been divided into two groups according to whether there was or was not coarse evidence of brain atrophy. The cases without brain atrophy were termed "mild" and those with brain atrophy were termed "severe." Amnesia, motor restlessness, disorientation, dementia and depression lead both series and in that order, except that allopsychic delusions stand fourth in the "mild" series and are far less common in the "severe." Nineteen symptoms occurred in 20 per cent. or over of the paretic series, namely, the five just mentioned, and nine others (irritability, defective judgment, psychomotor excitement, autopsychic delusions, insomnia, aphasia, hallucinations of doubtful or unspecified nature, convulsions, visual hallucinations) not always in like proportion in the two series. Five other symptoms occurred in each series, but symptoms quite sundered from one another in general significance. The "mild" cases showed a group of symptoms which might be termed contra-environmental, namely, allopsychic delusions, sicchasia (refusal of food), resistiveness, violence, destructiveness. The "severe" cases showed a group of symptoms of a quite different order, affecting personality, either to a ruin or its mechanisms in confusion and incoherence, or to the mental quietus involved in euphoria, exaltation, or expansiveness. In a series of 17,000 clinical cases (of all sorts of mental disease, alive and dead, recovered and impaired) symptomatologically analyzed, there were but ten symptoms occurring in 20 per cent. or over. These were in order, psychomotor excitement, allopsychic delusions, dementia, auditory hallucinations, motor restlessness, depression, autopsychic delusions, insomnia, incoherence, amnesia. The most positive results of this orienting study appear to be the unlikelihood of euphoria and allied symptoms in the "mild" or nonatrophic cases and the unlikelihood of certain symptoms, here termed contra-environmental, in the "severe" or atrophic cases. Such symptoms as amnesia and dementia appear to be approximately as common in "mild" as in the "severe" groups.

70. **Study of Optic Nerves.**—Fifty-eight unselected cases of mental disease were examined by Canavan; forty of these fifty-eight cases, or 68 per cent., exhibited changes in the optic nerves. Thirty-four cases showed chronic spinal cord changes by the same method (Weigert myelin sheath). Seven cases showed very slight changes in the spinal cord (although in all instances definite changes) when there were no changes demonstrable in the optic nerves. Of eighteen syphilitic cases (clinical evidence in some cases supported by

Wassermann reaction) there were fifteen showing optic nerve changes—one eye, three; both eyes, 12. In one case a spirochete was demonstrable by the Levaditi method in the pial sheath of the optic nerve in a case diagnosticated general paresis (although possibly one of cerebrospinal syphilis).

71. **Rôle of Hallucinations in Psychoses.**—Harrison made a careful statistical study of 514 cases. He found that hallucinations are among the commonest of symptoms met with in the insane, occurring in approximately 40 per cent. of the cases. Of the various types, those of hearing are most frequent, these occurring either separately or combined in 90 per cent. of the cases with hallucination. Next in frequency are those of hearing and sight combined, and then come visual disturbances alone. The content of the hallucinatory percepts were not characteristic for any particular psychosis. Visual disturbances seem especially peculiar to the catatonic praecox group. Hallucinations are common in dementia praecox, occurring in practically all the cases. On the other hand, they are rare in the manic depressive group, seldom if ever occurring typically. This fact is of diagnostic importance. Hallucinations are rare in arteriosclerotic dementia and senile dementia, occurring in approximately 20 per cent. of the cases. Hallucinations are rare in sane persons, even though they be of a psychopathic make-up.

Journal-Lancet, Minneapolis

March 15, XXXVI, No. 6, pp. 155-182

72 Sanitary Survey of Schools by Teacher. A. A. Whittemore, Bowman, N. D.
73 Some Essential Points in Treatment of Carcinoma of Uterine Cervix. E. W. Jones, Mitchell, S. D.
74 Syphilis. N. L. Linneman and E. L. Tuohy, Duluth.
75 Chronic Pancreatitis. J. W. Shuman, Sioux City, Ia.

Medical Record, New York

March 25, LXXXIX, No. 13, pp. 543-588

76 Pathogeny of Diabetes and Fecal Disinfection. G. D. Palacios, Caracas, Venezuela.
77 Smallpox and Vaccination. W. M. Kenna, Central Valley.
78 *Continuous Transfusion; Production of Immunity. A. Kahn, New York.
79 Soap. G. K. Dickinson, Jersey City, N. J.
80 Medical Inspection and Anthropometric Study in University of Porto Rico. L. A. Saliva, Rio Piedras, Porto Rico.
81 Plasterers' Corns and Bunions. G. F. Boehme, Jr., New York.

78. **Continuous Transfusion.**—Dogs were infected by Kahn by opening the peritoneal cavity, infected material was inserted into the cavity, and the wound was sewed tight with no drainage whatsoever. The next day the external jugular of the donor and the infected dog were exposed throughout the neck. The dogs were then turned head to head; the external jugular was cut in the middle in each dog and then joined for transfusion as follows: Upper end of vessel of dog A to lower end of vessel of dog B; the other two ends were similarly joined, then the clamps were removed, and blood was allowed to flow continuously throughout the circuit created between the two animals, from A to B and from B to A. In several of these experiments this continual trading of blood was kept up for over an hour. In dogs that were not transfused, death occurred in twenty-four to forty-eight hours, and in transfused dogs death was deferred from three to four days, or absolute recovery took place. All transfused dogs lived longer than the dogs that were not transfused.

Michigan State Medical Society Journal, Grand Rapids

March, XV, No. 3, pp. 105-162

82 Some Points in Treatment of Hypertension. J. L. Miller, Chicago.
83 Quarries in Urinary Tract. W. J. Cassidy, Detroit.
84 Vaccines and Serums in Treatment of Diseases of Eye, Ear, Nose and Throat. D. M. Campbell, Detroit.
85 Fundamental Principles Underlying Use of Obstetric Forceps. J. N. Bell, Detroit.
86 *Abscess of Tongue. J. V. White, Detroit.
87 *Tonsillectomy Some Years After Operation. B. R. Shurly, Detroit.
88 Tuberculosis of Seminal Duct. H. W. Plaggemeyer, Detroit.
89 Value of Social Service Department in Dispensary and Hospital Treatment of Syphilis. H. R. Varney, R. C. Jamieson and A. Walker, Detroit.
90 Cystic Tumors of Abdomen; Report of Three Cases. W. A. Hoyt. Ann Arbor.
91 *Some Experiments in Lung Surgery. C. Georg, Jr., Ann Arbor.
92 Case of Laryngeal Crisis in Tabes Dorsalis. J. S. Wendel, Ann Arbor.
93 Starvation Treatment of Diabetes. M. Marshall, Ann Arbor.

86. Abstracted in THE JOURNAL, Sept. 25, 1915, p. 1135.

87. Abstracted in THE JOURNAL, Sept. 18, 1915, p. 1055.

91. **Experiments in Lung Surgery.**—Georg reports details of nineteen experiments on dogs. It appears that intratracheal insufflation was not without harmful effects on the lungs even in those dogs which recovered. Interstitial emphysema and over distention of some of the alveoli of the lung were shown microscopically. These changes were much more marked in those animals that died than in those that recovered and consisted of large hemorrhagic areas with tearing of the walls of the alveoli. Insufflation also has a very harmful effect on the circulation in the lungs as is shown by the intense congestion and atelectasis found microscopically. In applying this method of anesthesia to intrathoracic operations on the human being Georg urges that great care must be exercised in order to have the pressure high enough to prevent pneumothorax and still not so high as to cause serious damage to the circulation in the lungs or to cause a severe degree of interstitial emphysema. The transplanation of a strip of fascia lata on a wound of the lung gives an added protection to it from infection. Preliminary ligation of the bronchi and careful suture of the lung tissue is insisted on by the author. After the suturing is complete careful search must be made for the escape of air from the lung wound by moistening it with salt solution. If any air escapes the wound must be reenforced by additional suturing. For intratracheal insufflation a catheter of number 18 to 24 French should be used and the pressure should be maintained at 20 to 25 millimeters of mercury.

Missouri State Medical Association Journal, St. Louis

March, XIII, No. 3, pp. 101-148

94 Diagnosis of Pregnancy by Way of Urine. E. B. Knerr, Kansas City.
95 Chronic Syphilitic Aortitis. J. C. Lyter, St. Louis.
96 Progress in Pediatrics for 1915. F. C. Neff, Kansas City.
97 Physician Himself. C. W. Head, Windsor.
98 *Changed Character of Later Lesions Occurring in So-Called Healed Tuberculous Joints. A. E. Horwitz, St. Louis.
99 Some Diseases of Duodenum and Complications Involving Surrounding Parts. N. I. Stebbins, Clinton.
100 Retouring Hinterland of Medicine. G. Homan, St. Louis.
101 Curriculum and Methods of Teaching in Nurse Training Schools. H. L. Bridge, St. Louis.
102 Case of Postoperative Ventral Hernia Without Usual Hernia Coverings. R. Hill, St. Louis.

98. **Later Lesions Occurring in Healed Tuberculous Joints.**—Three cases are cited by Horwitz. In all the cases the findings were constant and as follows: At an early age the patient suffered from a typical attack of tuberculous disease. The treatment was in accordance. A cure resulted in due time. A period of freedom existed for a number of years ranging from five to ten. Pain began to recur gradually. This was noted on use of the part only. No pain at night or when at rest. Pain greatest on first use of the joint, decreasing as motion or exercise increased. The same objective signs and findings were noted. Motions of the joint were limited on first manipulations. Further manipulations increased the range of motion and diminished the pain. Slight tenderness existed. Referred pain noted. The Roentgen ray showed the old necrosed bone and with new tissue replacing it. With these findings the treatment naturally consisted of manipulations and massage, the reverse to that employed in the original condition.

New York State Journal of Medicine

March, XVI, No. 3, pp. 105-166

103 Military Gunshot Wounds. C. Richard, U. S. Army.
104 *Treatment of Scarlet Fever With Fresh Blood From Convalescent Patients. A. Zingher, New York.
105 Schick Reaction and Its Applications. A. Zingher, New York.
106 Hereditary Syphilis in Children: Later Manifestations After Age of One Year. L. E. La Fetra, New York.
107 Syphilis in Parents as Cause of Feeblemindedness in Children. H. H. Goddard, Vineland, N. J.
108 Hereditary Syphilis; Early Manifestations From Intra-Uterine Life to One Year of Age. L. Kerr, Brooklyn.

109 *Rôle of Superior Mesenteric Vessels in Abdominal Disease. J. N. Hall, Denver.
110 Responsibility of Physician in Oral Infections. W. H. Haskin, New York.
111 Ependymitis; Report of Subacute Case Cured by Lumbar Puncture. A. C. Snell and J. Roby, Rochester.
112 Some Remote Effects of Bad Feedings. F. van der Bogert, Schenectady.
113 Nuts and Fruits; Their Value in Diet of Children. G. D. Scott, New York.

104. **Scarlet Fever Treated with Fresh Blood from Convalescent Patients.**—Zingher has employed fresh whole blood taken from the convalescent donor and injected into the patient's muscles. The blood obtained from the donor may either be injected directly, or it may be previously citrated by adding an ounce of blood to 1 c.c. of a 10 per cent. solution of sodium citrate making the final dilution of the citrate 0.33 per cent. The following muscles of the patient are chosen and a syringeful of blood is injected into each place: the gluteal regions, the outer regions of the thighs, calves, and the triceps muscles. Four ounces of blood can easily be injected into a young child, and 8 ounces into an older child or an adult. Zingher injected fourteen cases of toxic scarlet fever during the past winter. The majority of the patients were very toxic, and often delirious. The prognosis as a rule seemed doubtful and in several cases absolutely poor. The blood was obtained from donors who were convalescent from two to six weeks. The amount injected varied from 75 to 250 c.c., depending to some extent on the age of the patient. In seven of the cases the blood was citrated. One half of the patients received blood from one donor, the other half from two or more donors. The blood mass was absorbed without any local irritation except in one patient, who showed for a few days a painful tender swelling of one calf and the opposite gluteal region. It was not, however, due to infection and the local symptoms soon subsided. Of the fourteen patints injected, four died. In the remaining ten patients there appeared to be a distinctly favorable influence on the course of the disease. There was a distinct critical drop in temperature in cases not complicated by a streptococcus exudate, or inflamed cervical glands. An improvement in the general condition, however, is seen even in the later septic forms of the disease, although the local phenomena are not influenced to any extent. It seems, therefore, that in the later septic cases, in which the toxic element has disappeared from the clinical aspect of the case, these medium quantities of convalescent blood have no more specific action. By using larger quantities of fresh normal blood, a distinct beneficial effect on the disease may be exerted, especially by injecting from 8 to 10 ounces of blood, and repeating if necessary in four to five days. These larger quantities of fresh blood, containing a considerable amount of natural antibodies, have been found to exert a distinctly beneficial effect in several very septic late cases of scarlet fever admitted during the past winter.

109. Abstracted in The Journal, May 22, 1915, p. 1789.

Northwest Medicine, Seattle

March, XV, No. 3, pp. 73-108

114 Diagnosis and Treatment of Inflammatory Affections of Nasal Accessory Sinuses. C. A. Veasey, Spokane.
115 Scintillating Scotoma. G. W. Swift, Seattle.
116 Some Unusual Types of Cataract Operations. R. A. Fenton, Portland, Ore.
117 Future Ophthalmologist. J. L. McCool, Portland, Ore.
118 Blind in State of Washington. F. Bentley, Seattle.
119 *Unusual Case of Brain Abscess of Otitic Origin. E. E. Maxey, Boise, Ida.
120 Maternal Feeding. J. I. Durand, Seattle.
121 Infant Feeding. J. B. Manning, Seattle.
122 Recurring Colds in Children. P. D. McCornack, Spokane.
123 Diphtheria With Unusual Complications. M. B. Marcellus, Portland, Ore.

119. **Case of Brain Abscess.**—The mastoid portion of the temporal bone in Maxey's case consisted only of a thin shell of bone which enclosed an extension of the posterior fossa. The lateral sinus was not demonstrated, hence it must have been more than 2 cm. posterior to anterior wall of mastoid. The mastoid portion of posterior fossa was separated from external canal by not to exceed 2 mm. of bone, through which a bone necrosis caused direct communication between posterior fossa and soft parts of external canal. The median wall of mastoid cavity seemed to be intact, the only necrosed bone found being in anterior wall as mentioned above.

Pennsylvania Medical Journal, Athens

February, XIX, No. 5, pp. 315-398

124 *Venous Thrombosis and Embolism, Its Cause, Significance and Consequences. A. McLean, Detroit.
125 Some General Principles of Surgical Diagnosis. J. C. DaCosta, Philadelphia.
126 *Pulmonary Tuberculosis and Pregnancy. C. C. Norris, Philadelphia.
127 Practical Value of Diphtheria Toxin Skin Reaction. J. A. Kolmer, Philadelphia.
128 *Some Criteria Underlying Prognosis in Certain Forms of Heart Insufficiency. J. E. Talley, Philadelphia.
129 *Significance of Heart Pain. D. Riesman, Philadelphia.
130 *Inadequacy of Ordinary Methods of Disinfecting Typhoid Stools. E. M. Green, Easton.
131 Operative Treatment of Cancer of Intestines. L. J. Hammond, Philadelphia.
132 *Value of Psychopathic Hospital. D. J. McCarthy, Philadelphia.
133 Ethics of Fees and Fee Splitting. J. B. Roberts, Philadelphia.
134 Investments of Physician. T. S. Gates, Philadelphia.
135 Blood Changes in Bone and Joint Infections. J. K. Young, Philadelphia.
136 Pelvi-Abdominal Operation Performed in Roentgen Ray Room. E. O. Kane, Kane.

124. Abstracted in The Journal, Oct. 16, 1915, p. 1401.

126 and 132. Abstracted in The Journal, Oct. 23, 1915, pp. 1483 and 1484.

128. Abstracted in The Journal, Oct. 9, 1915, p. 1303.

129 and 130. Abstracted in The Journal, Oct. 30, 1915, p. 1579.

Southern Medical Journal, Birmingham, Ala.

March, IX, No. 3, pp. 193-282

137 Blood Pressure and Exercise Combined as Test of Heart Efficiency. J. S. Lankford, San Antonio, Tex.
138 New and Improved Method for Treating Opium, Morphin Addiction. S. T. Rucker, Memphis, Tenn.
139 *Pyelitis in Infancy and Early Childhood. L. R. DeBuys, New Orleans.
140 Study of Wassermann and Luetin Reactions Done Simultaneously on Five Hundred Cases. H. L. McNeil, Galveston, Tex.
141 Plea for Uniformity in Wassermann Reaction. C. W. Shropshire and C. Watterston, Birmingham.
142 Arkansas Hot Spring Baths. E. H. Martin, Hot Springs, Ark.
143 Intensive Community Health Work: Its Value in Development of Public Health Agencies. J. A. Ferrell, New York.
144 Rural Sanitation in South. Two Vital Forces: Wholetime County Health Officer and Specialized Units of Health Work by State Boards of Health. J. H. Way, Waynesville, N. C.
145 Sanitating Rural Home. R. N. Whitfield, Florence, Miss.
146 Pellagra. Diet as Essential Element in Its Cause and Cure. C. A. Grote, Jasper.
147 Soil as Possible Medium for Etiologic Factor of Pellagra. C. C. Parrish, Fort Worth, Tex.
148 Pellagra Investigations in Georgia State Sanitarium for Insane. E. M. Green, Milledgeville, Ga.
149 Plea for Conservation of Health. H. S. Mustard, Charleston, S. C.
150 Study of Bone Repair. I. Cohn and G. Mann, New Orleans.
151 Post Hospital Care of Surgical Patient. S. McGuire, Richmond, Va.
152 Movable Kidney; Its Medicolegal Significance. W. W. Crawford, Hattiesburg, Miss.
153 Congenital Cataract; Hereditary Influences. R. H. Gantt, Spartanburg, S. C.
154 Relation of Systemic Conditions to Ocular Diseases. J. O. McReynolds, Dallas, Tex.
155 Fistula-in-Ano in Child. S. L. Boccellato, Memphis, Tenn.

139. Abstracted in The Journal, Dec. 11, 1915, p. 2118.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Bristol Medico-Chirurgical Journal

December, 1915, XXXIII, No. 129, pp. 129-235

1 Foundation of Bristol Medico-Chirurgical Society and History of Military Medicine in England. G. Parker.
2 Heart Diseases and Disorders in Warfare. C. Coombs.
3 Removal of Bullets and Other Metallic Foreign Bodies. R. G. P. Lansdown.
4 Evolution of Sense of Sight. F. R. Cross.
5 Gunshot Injuries to Eyes. E. H. E. Stack.

British Journal of Children's Diseases, London

March, XIII, No. 147, pp. 65-96

6 *Case of Splenomegaly with Anemia and Hemorrhages Due to Portal Thrombosis. J. Galloway.
7 Cure of Squint. N. B. Harman.
8 *Single Pelvic Kidney. J. D. Rolleston.

6. **Splenomegaly with Anemia Due to Portal Thrombosis.**—Galloway is convinced that in this case (patient a boy 8½ years of age), the splenomegaly and anemia were actually associated with portal thrombosis, and that almost certainly the portal thrombosis was the primary cause of the whole condition. The type of pyrexia present deserved attention. There was a sudden rise of temperature from 97.8 to about 106.2 with rigor. The lad complained of a certain amount of pain in the abdomen, and he vomited a little, but very little evidence of illness was present relative to the remarkable rise of temperature. The abdomen remained flaccid though a small quantity of fluid was still present, the spleen did not enlarge, the liver remained palpable below the costal margin. The temperature fell suddenly on the following morning to 102.4, rising in the afternoon of that day to 104. On the next day it fell to 99; on the next it was subnormal, and remained normal subsequently during his stay in the hospital. The day after the rigor and sudden rise of temperature the lad seemed to be almost in the same condition as before. In spite of the very severe febrile reaction the patient showed little sign of illness. The degree of fever would certainly in other cases have given rise to symptoms of severe toxemia or septicemia, but in this case the patient's general condition was remarkably little disturbed. Galloway has very little doubt that the febrile attack was associated with the increase and spread of the portal thrombosis— probably widely in parts of the portal circulation hitherto unaffected. Galloway believes that the occurrence of fever of this character in such cases would probably assist in the recognition of portal thrombosis.

8. **Single Pelvic Kidney.**—The specimen described by Rolleston combines the following rare conditions: (1) unilateral renal defect, (2) congenital renal misplacement or dystopia, (3) dilatation and hypertrophy of the ureter, with congenital stricture at its vesical extremity.

British Medical Journal, London

March 4, I, No. 2879, pp. 333-364

9 *Treatment of Gunshot Wounds. B. Moynihan.
10 Delayed Tetanus. G. Barling.
11 Treatment of Tetanus. R. G. Abercrombie.
12 Visual Neuroses of Miners in Their Relation to Military Service. C. F. Harford.
13 Eusol Treatment for Conjunctivitis. F. Jefferson and W. E. M. Armstrong.

9. **Treatment of Gunshot Wounds.**—Excision of the wound, if it can be practiced, Moynihan says, is an ideal method. Unhappily the great majority of the injuries inflicted are of such a kind that the wound surfaces are most irregular. An accurate excision of the surfaces of an anfractuous wound is, therefore, hardly possible in the majority of cases. In all cases of large or penetrating wounds a thorough examination and preparation of the wound for its subsequent dressings must be made. The skin must be cleansed thoroughly, by soap, ether, benzin or other efficient material, and an antiseptic liquid applied. Biniodid of mercury in spirit, Harrington's solution, Macdonald's solution, or Dakin's solution are the most effective. The latter, for the purposes of war, is to be preferred, for the subsequent irrigation and dressing of the wound may be carried out with the same preparation. After cleansing the skin adequate drainage must be secured. Whatever is necessary to secure full and free drainage must be done ruthlessly since the necessity for the unimpeded escape of all wound discharges is paramount. Moynihan points out that it is not yet sufficiently realized that immobilization of wounds in the soft parts is essential. The comfort of the patient is sensibly increased, and the spread of infection is checked.

In the treatment of all gunshot wounds in which the septic processes are raging, and the temperature varies through several degrees, an immense advantage will accrue from placing the patient out of doors. Speaking of vaccine therapy, Moynihan says, if a wound is imperfectly drained or not properly dressed, the administration of heroic doses of the most potent vaccine is merely futile. When, however, a wound is well drained and there is a free access of serum to the wound, with a free opportunity for its discharge into the wound and of rapid escape from it, then it would seem reasonable to suppose that the more potent the bactericidal power possessed by the serum, the greater will its effect be in causing the wound to clean and to heal. This suggests that the vaccine treatment, in conjunction with the application of Wright's solution, will be likely to give the best results. Of the great value of the streptococcus vaccine in the serious wounds of this war Moynihan is thoroughly convinced, and he has no doubt whatever that advantage would be gained by a freer use of it in cases of infection with this most obdurate organism.

Indian Medical Gazette, Calcutta

February, LI, No. 2, pp. 41-80

14 New Operation for Cataract. H. Smith.
15 Use of Conjunctival Flap in Operations for Intracapsular Extraction of Cataract by Smith's Method. A. E. J. Lister.
16 Training of Assistant in Smith's Operation for Intracapsular Extraction of Cataract. A. E. J. Lister.
17 New Method of Extraction of Cataractous Lenses. L. B. Nath.
18 Emergent Abdominal Surgery. C. Barry and S. T. Crump.
19 Eosinophilia in Some Cases of Helminthiasis. J. A. Sinton and J. D. Baily.

Lancet, London

March 4, I, No. 4827, pp. 495-544

20 Clinical Thermometry; Continuous and Quasicontinuous Temperature Records in Man and Animals in Health and Disease. G. S. Woodhead and P. C. Varrier-Jones.
21 Tabular Statement of Five Hundred Abdominal Gunshot Injuries. C. Wallace.
22 Diagnosis of Fevers Among Mediterranean Expeditionary Force. R. A. P. Hill.
23 *Puerperal Fever Fiction and Notification Farce. W. E. Fothergill.
24 Treatment of Septic Wounds With Simpson Light. J. A. Menzies.
25 Diet as Factor in Causation of Mental Disease. (To be continued.) C. Mercier.
26 *Etiology of Sarcoma in Rat. A. S. Leyton and H. G. Leyton.

23. **Puerperal Fever Fiction and Notification Farce.**—Fothergill says it is high time that the use of the term "puerperal fever" was dropped. It has been known for over sixty years that no such disease exists, but the abstract idea connected with the name will persist so long as the name continues to be used.

26. **Etiology of Sarcoma in Rat.**—Rat sarcoma after an immersion for twenty seconds in boiling water, was finely minced with the object of breaking up some of the nuclei, and the minced tumor made into an emulsion with saline solution. The emulsion was filtered through a Chamberland filter (B or F). The filtrate was plated out in the ordinary way on glucose glycerin agar and a streptothrix isolated in several cases. In similar fashion the Leytons also isolated but not yet investigated a streptothrix from mouse carcinoma. In order to test the relationship of the streptothrix to the formation of sarcoma, it was injected several times into the subcutaneous tissue and into the peritoneal cavity of rats, and several were also fed with it weekly for some time. So far, a tumor has resulted in one of the fed rats only. In the mediastinum was a growth about the size of a cherry, together with several smaller ones. It has all the characters of a spindle cell sarcoma and is inoculable. From it the streptothrix has again been isolated. The streptothrix in question appears to be either very pleomorphic or several species are to be found in rat sarcoma. The authors have also isolated one by the same method from the washings of the hair of a sarcomatous rat, but not, so far, from that of a normal rat. According to the Leytons the site of infection would probably be the cell nucleus, since most of the characteristics of malignant growth point to irritation of the nucleus.

Practitioner, London

March, XCVI, No. 3, pp. 231-346

27 *Operative Treatment of Fractures in Warfare. A. Lane.
28 *War Fractures. G. Taylor.
29 Uses and Limitations of Stereoscopic Roentgenography in Diagnosis of Injury to Bone; After-Treatment of Fractures. F. Hernaman-Johnson.
30 *Fractures Treated by Operation. H. W. Drew.
31 Three Unusual Fracture Cases From Frensham Hill Military Hospital. J. Connell and S. F. Freyer.
32 Gunshot Wounds of Upper Limbs. E. Delorme.
33 Immediate Treatment of Head Injuries From Projectiles. A. Schwartz and P. Mocquot.
34 Amputations; Their Prevention and After-Treatment. T. H. Openshaw.
35 Shrapnel Bullet Wounds. S. Wickenden.
36 Medical Aspects of Chest Injuries. R. M. Leslie.
37 Amebic Dysentery. G. C. Low.

27. **Operative Treatment of Fractures.**—Lane states that only in very exceptional circumstances is it advisable to fix fragments of broken bones together by means of plates and screws while the wound is very foul. If, for certain reasons, such a procedure is deemed necessary, screws should not be inserted near the broken extremities, but as far from the seat of fracture as possible. Lane holds that it is advisable to postpone operative interference till the wounds have healed, when the issues are, in all probability free of organisms. If any apparently septic focus is observed during an operation, a culture and a vaccine should be obtained from it, and employed at once should symptoms of infection of the wound develop. Should there be any definite suspicion of the presence of latent sepsis, effective drainage must be adopted at once. If not, the wound should be closed completely at the time of operation. Every attempt should be made to avoid any shortening of the limb, or to reduce it to a minimum. The apposition of the whole areas of the broken ends is not necessary, since the interval will fill up subsequently if suitable means be adopted. Fragments of bone or callus should be saved and employed to fill any interval between the pieces of the shaft. Lane found that much heavier steel plates are required in this class of case than are usually employed in the less comminuted fractures of civil life. The steel plates now supplied to the military hospitals are three times as resistant as those employed previous to the war. It is most important that the joints which are in relation with the fractured bone shall be moved as soon as possible after operation, in order to avoid that stiffness and limitation of movement that so often complicate these fractures.

The sooner the patient who has been operated on for fracture of one or more long bones of the leg is up and about, the more bone will be deposited, and the more rapid will be the repair at the seat of fracture. For this purpose a good ambulatory splint is a necessity. Should the interval between the fragments be so considerable that union is not likely to take place, even after prolonged congestion, brought about by the use of an ambulatory splint, the fragments should be secured in perfect alignment by a plate fixed vertically behind the center of the shaft. When this has been done, a portion of one of the fragments, which is usually equal in thickness to a third of the total circumference of the shaft, can be sawed off and secured over the interval between the fragments, any piece of bone removed to accommodate the graft in the other fragment being fitted to occupy such existing interval as may be left between the bones. If enough material cannot be obtained from the fractured bone to make a graft, it must be secured from some other bone, but the former is usually the more convenient for the purpose. Lane is of the opinion that most of the failures of bone grafting for extensive loss of substance are due to the surgeons depending on the unsatisfactory grip which the graft alone can be made to exert on the fragments of the shaft. Finally, in closing, Lane says: "A great deal of nonsense has been talked about the screws and plates acting as foreign bodies if used in simple fractures, and producing a rarefying ostitis around them. Should such rarefying ostitis exist, it is undeniable evidence that the technic of the operator is faulty, and not the procedure. The remedy is in the hands of the surgeon, who must improve his methods. Frequent failures in unskilled hands have led many to attribute their want of success to the employment of steel plates and screws, and to attempt to avoid sepsis by using other and much less effective means."

28. **War Fractures.**—Taylor and his associates have made extensive trial of various antiseptics in the treatment of gunshot wounds, and have also used saline largely; but, Taylor has been most impressed by the sulphur and glycerin emulsion. He also emphasizes first, the danger and disaster that may result from the treatment of septic compound fractures by means of plates and screws; and, second, that these cases, if the position be unsatisfactory, should be dealt with by operation, to secure fixation and proper alignment only when the wound has healed.

30. **Fractures Treated by Operation.**—Drew is convinced that in appropriate cases and under suitable conditions, operation by plating is the only satisfactory treatment. It is better to wait until the necessary conditions can be obtained than to undertake the operation with inadequate assistance, or under conditions that are not perfect, for a week or two makes little difference to the operation.

Sei-I-Kwai Medical Journal, Tokyo

February, XXXV, No. 2, pp. 5-10

38 Tubercular Peritonitis and Its Surgical Treatment. Y. Takaki.

Archives des Maladies du Cœur, etc., Paris

February, IX, No. 2, pp. 45-92

39 *Incomplete Forms of Exophthalmic Goiter and Neuroses of Tachycardia Type. (Quelques remarques sur les névroses tachycardiques et la maladie de Basedow fruste. Type inverse rythmique et thermique; hypertension légère; formes cliniques.) L. Gallavardin.
40 *Partial and Total Heart Block. (Les dissociations auriculo-ventriculaires.) J. Heitz.

39. **Neuroses of Tachycardia Type.**—Gallavardin recalls that tachycardia of sinus origin is merely an acceleration of the normal heart rhythm, but when the stimulus starts at some abnormal part of the heart, paroxysms of irregular tachycardia may result, of the type of auricular flutter, tachycardia from massed extrasystoles, and paroxysmal tachycardia of various kinds. The sinus tachycardia, on the other hand, includes the tachycardia from efforts, emotions, intoxications, and reflex action, also the regular tachycardia of organic heart disease, and the tachycardia of exophthalmic goiter. In addition to these there is a vast group of cases of tachycardia evidently the manifestation of a neurosis, and extremely variable, varying spontaneously from moment to moment, from day to day and from period to period. The tachycardia is more pronounced in the morning than in the afternoon, and the temperature is liable to be higher in the early morning. The blood pressure is also a little above normal with these tachycardia neuroses. They may be of a spontaneously continuous type or occur in episodes or come on only after exertion. Five typical cases are described and the identity between the clinical picture and that presented by the incomplete type of exophthalmic goiter is emphasized. Both are unmistakably the result of intense stimulation of the sympathetic system. Is the thyroid at the bottom of both, he queries, or is the sympathetic syndrome elicited by a different cause in each?

40. **Epinephrin in Heart Block.**—Heitz cites Routier's classification of auricle-ventricle dissociation as simple heart block, complete dissociation, and partial dissociation. The trouble may be in conduction of the impulse or in the generation of the impulse. Recent experimental research has demonstrated that there is certainly some connection between the cardiac fibers of the sympathetic and the conduction of the impulse, but that the latter is almost entirely, but not quite, independent of these fibers. The connection is enough, however, to justify the administration of epinephrin when the conduction is being interfered with, as epinephrin has such a marked action on the sympathetic nerve. Routier arrested conduction by nipping with forceps the bundle of

His in dogs. The auricle beat was 140, the ventricle 55, in one typical experiment of the kind. Then an injection of epinephrin was made and in twenty seconds the auricle beat became 115 and the ventricle beat also 115, showing that the heart block had been overcome. As the effect of the epinephrin passed off, the auricle beat increased to 120 while the ventricle beat dropped to 42. These results of epinephrin treatment occur the same even when the first two thoracic ganglia have been removed, confirming the assumption that epinephrin acts on the terminal nervous apparatus in the heart. It accelerates the beat by its action on the nerve terminals in the coronary sympathetic plexus, but it arrests the heart block through the sympathetic fibers in the bundle of His, stimulating the bundle until it is able to resume its task of conduction, thus rendering possible the passage of the wave of contraction so long as the bundle of His is not entirely destroyed. We must yield a larger place to the nerve factor in our estimation of dissociation of the auricular and ventricular beat. The nerve factor may be within or without the heart, according as the disturbance in conduction is the result of hypertonicity of the vagus or of functional insufficiency of the sympathetic. Epinephrin has thus been demonstrated to have a regular place in treatment of heart block.

Archives Mens. d'Obstétrique et de Gynécologie, Paris

December, 1915, IV, No. 12, pp. 433-464

41 Useless Operations. (Quelques remarques à propos des opérations inutiles, donc indésirables.) G.-A. van Leeuwen (Amsterdam).
42 Protection for Pregnant Women and Infants at Paris During the War. G. Vitoux.

Bulletin de l'Académie de Médecine, Paris

February 22, LXXV, No. 8, pp. 203-244

43 *The Wassermann Reaction in Chronic Diseases. M. Letulle and A. Bergeron.
44 Systematic Care for and Training in Hygiene of Tuberculous Soldiers. M. de Fleury.
45 *Vertigo of Gastric or Aural Origin. (Vertige stomacal et vertige auriculaire. Le vertige auriculo-stomacal.) G. Linossier.
46 Paralysis of Ocular Muscles from Picric Acid. (Paralysie oculaire au cours d'une intoxication par l'acide picrique. Sur la présence de l'acide picramique dans le liquide céphalo-rachidien.) G. Guillain and H. Pecker.
47 Report of Medical Mission to Serbia. (Notes médicales à propos de mon sejour en Serbie.) Chaix.
48 *Solid Transmitter for the Ausculted Voice. (De l'auscultation de la voix solidienne, à distance en clinique pour le diagnostic précoce du début de la tuberculose pulmonaire.) Glover.
49 *Graduation and Dosage of Sunlight in Heliotherapy. (Sur un moyen simple de graduation et de dosage des rayons solaires en thérapeutique.) H. Bordier.

43. **The Wassermann Reaction in Chronic Diseases.**—Letulle and Bergeron have applied the Wassermann test to nearly every person admitted to the Boucicaut hospital in the last four years, and they obtained a positive response in 296 of the 608 patients with chronic liver, kidney, heart or vascular disease or disease of the nervous system. In 13 others the reaction was doubtful. Among 253 patients with paresis, paraplegia, myelitis or epilepsy, a positive reaction occurred in 136, that is, in more than 50 per cent. It was positive likewise in 90 of 168 with chronic disease of the heart or vascular system, and in 34 of 75 with cirrhosis of the liver, and doubtful in 3. A positive reaction was observed likewise in both of the 2 cases of paroxysmal hemoglobinuria. Among 116 patients with chronic kidney disease, 74 gave a negative reaction.

45. **Paroxysmal Vertigo.**—Linossier discusses vertigo in general and emphasizes the necessity for distinguishing between that for which the internal ear is responsible and that brought on by digestive disturbances. He expatiates further on the vertigo in which both of these factors cooperate. The digestive type is the most common, and by treating the dyspepsia we are able to eliminate the digestive factor and thus possibly arrest the manifestations entirely. In every case of Ménière's disease the stomach functioning should be carefully investigated and appropriate treatment instituted. In the discussion that followed, Hayem remarked that the congestion of the face frequently noticed with difficult digestion may extend to the internal ear and cause disturbance enough to bring on the labyrinthic vertigo even when the internal ear otherwise seems normal.

48. **Transmission of Vocal Vibrations Through Solids in Diagnosis of Pulmonary Tuberculosis.**—Glover calls the principle on which his auscultation apparatus is based the *vibrations vocales solidiennes* in contrast to the *vibrations vocales aériennes.* The voice is heard through a solid instead of through the air, and the sounds vary according as the air passages below are normal or diseased, so that by comparing the two sides the evolution or regression of anatomic lesions can be traced and they can be detected in their incipiency. No description is given of the apparatus, but Glover's work in this line won for him the Lallemand prize in physiology in 1915.

49. **Dosage in Heliotherapy.**—Bordier uses gauze stretched on a frame. Held close to the skin, each thread casts a distinct shadow, but held at a certain distance the shadows blend and the light falls evenly all over the area. It is not a filter, but merely graduates and diffuses the light, protecting against sunburn. The dosage can be graduated with a photographic paper as he describes in detail.

Lyon Chirurgical, Lyons

December, 1915, XII, No. 6, pp. 701-841

50 Why, How and Where to Operate for Abdominal Wounds? (Pourquoi, comment et où faut-il intervenir dans les plaies de l'abdomen?) G. Tisserand; (Essai sur les indications opératoires dans les plaies pénétrantes de l'abdomen.) P. Vignard; (Traitement des plaies pénétrantes de l'abdomen par projectiles de guerre.) A. Chalier; (Balles mobiles et balles fixes dans la cavité abdominale.) P. Goullioud and Arcelin.
51 *Vicarious Partial Restoration of Function Possible After Section of Spinal Cord? (Remarques sur un cas de section complète de la moelle épinière suivie d'une restauration partielle de la sensibilité et des mouvements des régions d'abord paralysées.) J.-P. Morat.
52 Septic Meningitis From Skull Wound Followed by Aseptic Suppurative Meningitis; Recovery. A. Policard and B. Desplas.
53 *Device to Correct Muscular Constriction of the Jaws. (Traitement de la constriction myopathique des mâchoires.) A. Pont.
54 Failure of Treatment of Tetanus; Fifteen Deaths in Eighteen Cases. C. Laurent.
55 Bullet Ruptures Humeral Artery; Three Cases. J. Murard.
56 Advantages of Primary Subperiosteal Removal of Splinters of Long Bones. (Résultats de l'esquillectomie sous périostée primitive dans les fractures diaphysaires par coups de feu.) R. Leriche.

51. **Restoration of Function After Severing of Spinal Cord.**—Morat suggests that it might be possible to substitute for the severed spinal cord some fibers from the sympathetic system to bridge the gap, training the ganglion system to do, alone, the work which it usually does merely as an auxiliary to the spinal cord.

53. **Muscular Contraction of Wounded Jaws.**—Pont says that in over 2,250 cases of fracture of the jaws in his special service at a base hospital, there was muscular constriction in 500. He gives photographs of some of the devices he has found useful in correcting the constriction, urging the necessity for prompt correction of myopathic constriction of any kind.

Paris Médical

February 26, VI, No. 9, pp. 213-228

57 *Hysteric Hemiplegia After Shock From Shell Explosion. (Les maladies méconnues: Anesthésies et analgesies hystériques.) P. Chavigny.
58 Organization of the Medical Department of the Italian Army. (L'organisation du service sanitaire dans l'armée Italienne.) U. Gasperini.
59 Improved Technic for Resection of Astragalus. (Nouveau procédé d'astragalectomie.) E. Destot.
60 Gas Gangrene and Its Treatment. J. Fievez.
61 *Radiotherapy of Cicatrices. M. Mercier.

57. **Hysteria in Soldiers.**—Chavigny comments on the harm liable to be done by skepticism as to the occurrence of hysteric disturbances among the troops on active service. One man, for example, had hemiplegia after a shell explosion near by, and when Chavigny first saw him, nearly a month later, he had been treated with repeated lumbar puncture and dry cupping along the spine. His hemiplegia was as complete as ever and there was already question of a pension. He had had hemi-anesthesia from the start, which should have warned of hysteria as the cause of the trouble,

and the man should have been cured long ago by reeducating the sensibility. Five other typical cases are described in which this was done, and the men were promptly cured. The revealing hemi-anesthesia was tested with the faradic current. On the sound side it elicited regularly movements of withdrawal while on the hemiplegic side even the strongest current did not seem to be felt at all. This anesthesia was thus of the true Charcot type, and as it yielded to systematic application of the faradic current to the skin, in the course of ten days to three weeks, the hemiplegia subsided with it.

61. **Radiotherapy of Impeding Cicatrix.**—Mercier reports excellent results in many cases from exposure to the Roentgen rays of cicatricial tissue impeding the use of the fingers, hand, arm, etc., after war wounds. In three or four sittings the scar tissue softens up, the fibrous tissue binding it down seems to be absorbed, and the tendons and muscles caught in the cicatrix regain their functional play. He gave from eight to twelve exposures.

Presse Médicale, Paris

February 24, XXIV, No. 11, pp. 81-88

62 Reflex Contracture and Paralysis After Gunshot and Shell Wounds. J. Babinski and J. Froment.
63 *Preferable Concentration for Surgical Solutions. B. Cunéo and L. Meunier.
64 Immobilization of Fractured Lower Jaw. (Procédé simple de contention des fractures du maxillaire inférieur.) A. Herpin.

February 28, No. 12, pp. 89-96

65 *Threads as Drains. (Le drainage filiforme.) H. Chaput.
66 Agglutination in Diagnosis of Typhoid in the Vaccinated. (La séro-réaction de Widal a-t-elle une valeur diagnostique chez les vaccinés?) M. Salomon.
67 Differentiation of True and False Heart Disease. (La récupération des faux cardiaques.) C. Aubertin.

63. **Most Favorable Concentration for Surgical Solutions.**—Cunéo and Meunier state that the freezing point of pus varies with the age of the suppuration. At first it averages —0.55 or 0.56 but as the process tends to heal, the figure drops and gradually reaches —0.40. The widest range they ever obtained was from —0.94 to —0.38. They suggest that the figure —0.40 thus represents the optimum toward which Nature is striving, and hence that surgical solutions should have this optimal freezing point of —0.40. Tests of some of the surgical solutions in vogue revealed in fact that they had this actual freezing point. They give a table of formulas for various surgical solutions with a freezing point at —0.40 including Dakin's solution; hydrogen dioxid at 1:6; a solution of 2 gm. iodin, 15 gm. potassium iodid and 1,000 c.c. distilled water; 34 gm. glucose with 1,000 c.c. distilled water; 5.75 gm. sodium chlorid and 1,000 c.c. distilled water—all with a freezing point at —0.40.

65. **Thread Drainage.**—Chaput expatiates on the advantages of one or more threads, silk fibers, wires or rubber pencils from 3 to 7 mm. in diameter to drain wounds, abscesses and fistulas. He insists that the drainage is always good because the thread passes through openings very large in comparison to its diameter; there is no dead space, and the lips of the wound fit around the thread drain like a valve, preventing ingress of air. Abscesses and other lesions heal more rapidly than with tube drains, and leave less traces. The abscess can be punctured at several points and a small silk thread introduced at each, thus facilitating healing with the least disfigurement. He reviews his extensive experiences with this filiform drainage, as he calls it, in abscesses of the breast and anus, tendon-sheath phlegmons, suppurating wounds of the knees or other joints, in peritonitis, in tuberculous bone and joint affections, and after hysterectomy and other operations. A number of minor technical points are mentioned for each of these applications. Among the advantages extolled are that the filiform drains leave no scar, protect against sloughing of tissues, are not so painful as drain tubes, avert complications, and protect against infection from without. They heal up a purulent pleurisy in a few days, without leaving a fistula or requiring resection of ribs. They do not keep the wound discharging, like tube drains, and he found that all wounds and cavities, aseptic or infected or tuberculous, healed up remarkably fast, as a rule in from ten to fifteen days.

Revue de Chirurgie, Paris

December, 1915, XXXIV, No. 10-11-12, pp. 433-706

68 *Indications for Removal of Projectile in Heart; Case of Bullet in Right Auricle. (Extraction d'une balle dans l'oreillette droite du cœur.) Couteaud and Bellot.
69 Principles for Management of Suppurating Gunshot and Shell Wounds. (Quelques préceptes élémentaires relatifs au traitement des plaies de guerre suppurées.) L. Bérard and A. Lumière.
70 Wounds of the Spleen. (Les plaies thoraco-abdominales de la rate.) X. Delore and Kocher.
71 *Primary Duodenal Cancer. (Le cancer primitif et intrinsèque—non vatérien—du duodénum.) E. Forgue and E. Chauvin.
72 *Coxa Valga. G. Worms and A. Hamant. Commenced in preceding Number.

68. **Bullet in Right Auricle.**—The soldier spat blood for several hours after the bullet wound below the clavicle, but had no seriously menacing disturbances beyond agonizing pain back of the sternum, and headache. Later there were syncopes and dyspnea after exertion, and every sudden movement was liable to bring on severe palpitations, and there was a constant sensation of constriction and oppression in the chest. The sixth month there was an acute attack of myocarditis and pericarditis, the heart action alarmingly irregular for a week. Then this severe condition became mitigated but returned again. The man was afraid to make the slightest effort, fearing to bring on a serious attack of "crazy heart," and such frequently developed, notwithstanding all his care. The sixth month the bullet was extracted at a fifty-minute operation. Scraps of cloth were found in its bed in the auricle wall, and the myocardium at this late date was found degenerated beyond repair. The man bore the operation well, but the heart action grew weaker and weaker and finally failed completely the eleventh hour.

71. **Duodenal Cancer.**—Forgue and Chauvin devote 111 pages to a study of primary and intrinsic cancer in the duodenum—apart from the ampulla of Vater. They give an illustrated description of a case in a woman of 52 who succumbed the third day after the operation, and give full summaries of forty-four cases from international literature. As cancer in this region is liable to involve or encroach on the stomach or bowel, bile ducts or pancreatic duct, or all combined, the clinical picture may be most diverse and extensive in different cases. Symptoms had been noted for from only a few days to two years in the cases compiled. The exact diagnosis is practically impossible; it was not even suspected in forty-three of the forty-five cases. An operation was attempted in only eleven of the cases. Gastroenterostomy was done in four cases with two deaths.

72. **Coxa Valga.**—Worms and Hamant remark that the symptoms from coxa valga are generally masked by those of the bone disease responsible for its development. If not, it may simulate simple coxalgia or dislocation of the hip joint. There is no pathognomonic sign unless possibly when radiography shows the angle of the slant of the neck of the femur abnormally large. The insidious onset, the pains in the hip and knee, the slight limp, and the youth of the patients suggest tuberculous hip-joint disease. Extension for a few days promptly relieves the pain with coxa valga, and thus aids in differentiating it. Orthopedic measures are usually all that is needed, with treatment of the underlying trouble. Of the three operative methods that have been tried, linear osteotomy at the base of the neck respects the leverage for the muscles and is done outside the joint. Resection of a wedge below the trochanter corrects the vicious attitude without restoring normal conditions otherwise, but has done good service in the hands of David, Allison and Clarke, when the coxa valga interfered seriously with the use of the limb.

Revue Médicale de la Suisse Romande, Geneva

February, XXXVI, No. 2, pp. 65-132

73 *Progressive Hydrophthalmia. (L'hydrophthalmie progressive, cas particulier des dilatations idiopathiques des organes cavitaires.) L. Bard.
74 *Diagnosis of Incipient Pulmonary Tuberculosis. (Le diagnostic clinique et pratique de la tuberculose pulmonaire débutante.) R. Burnand.

73. **Progressive Hydrophthalmia.**—Bard is convinced that the condition of the eye known as buphthalmia is connected with some congenital malformation, and that it belongs in

the same category as cystic disease of the kidney or breast, hydrocephalus and certain forms of syringomyelia. The term "infantile glaucoma" is not appropriate; in a recent case encountered the tension was below rather than above normal. In all these cases of idiopathic enlargement of hollow organs, any inflammatory features are surely secondary. Cystic disease of the breast and kidney, likewise, have nothing to do with inflammation or a new growth unless secondarily. They are all more like a vascular angioma, some malformation in quality or structure, rather than shape of the wall allowing it to stretch without any pressure from within. This same explanation applies to certain cases of dilatation of the bronchi or segments of the digestive apparatus. In a recent case, idiopathic dilatation of the rectum occurred just above the normal anus, with no kink nor stricture to explain it otherwise. In another case the bladder, ureters and the pelvis of both kidneys, in a youth of 16, stretched in this way, gradually entailing atrophy of the kidneys and finally death from uremia, without anything being found during life or after death that could have presented an obstacle to the voiding of the urine and thus have explained this essential cystohydronephrosis. This anatomic-clinical type is to the urine excreting apparatus what polycystic degeneration of the kidney is to the glomerulitubuli secreting system.

74. **Clinical and Practical Diagnosis of Incipient Pulmonary Tuberculosis.**—Burnand is chief of the public sanatorium at Leysin. He relates that the course of the pulmonary trouble in patients there often belies the diagnosis that had accompanied them when they arrived. He insists that anomalies of the respiration are so common that the normal type is the exception in adults, even in those entirely free from tuberculosis, and particularly in those with healed tuberculous lesions. Many persons come to Leysin labeled tuberculous on account of debility and anemia for which in reality some heart, kidney or thyroid trouble is responsible. The assumption that tuberculosis is present when the temperature goes up half a degree Centigrade after an hour's exercise, has been shown to be erroneous by the experiences at Leysin. In a number of such cases of constant subfebrile temperature, some nontuberculous lesion outside of the lung was responsible for the abnormal temperature, although in every case the attending physician had never hesitated in ascribing it to tuberculosis as the apex findings were not quite normal. In some of the cases the subfebrile temperature was finally traced to enteritis or latent appendicitis, general nervousness, simulation, sinusitis or tonsillitis. More or less latent gynecologic or urinary disease is often responsible for the slight rise in temperature, especially of the premenstrual type. Anything of this kind readily explains a rise of temperature after an hour's exercise or a persisting, slightly abnormal temperature. In the majority of cases, however, some tuberculous lesion is responsible for the temperature, but it is hidden away in some bone or joint, and has nothing to do with the lungs. He says of "incipient" tuberculosis that the only incipiency which we are able to recognize, as a rule, is when an old latent lesion rouses to active progress. The various types of constitution are encountered among the tuberculous, he emphasizes, in as great variety as among the general populace. Those presenting the so-called pretuberculosis type are in all probability already a prey to tuberculosis. Acquired or inherited, the tuberculosis may persist torpid and attenuated, but it cannot be called latent, as it entails the aspect which we call "predisposed to pulmonary tuberculosis," malformation of the chest from the lesions within, the toxic changes in muscles or organs or a general dystrophy. Hereditary influences in the diagnosis are of less import than the familial conditions at a given time. A history of preceding affections of lung or pleura of other origin is also important as explaining the local findings.

Correspondenz-Blatt für Schweizer Aerzte, Basel

February 26, XLVI, No. 9, pp. 259-288

75 Relations Between the Ductless Glands and the Circulation of Blood. (Beziehungen der endokrinen Drüsen zum Blutkreislauf.) A. Oswald.

76 Fitness for Military Service of Swiss Recruits. (Recherches sur l'aptitude physique au service militaire et sur la résistance individuelle des recrues.) F. Messerli.

Gazzetta degli Ospedali e delle Cliniche, Milan

February 24, XXXVII, No. 16, pp. 241-256

77 The Bacterial Flora of Gas Gangrene. G. De Angelis.

Policlinico, Rome

February 20, XXIII, No. 8, pp. 229-260

78 *War Typhoid. (Appunti pratici intorno al tifo di guerra.) C. Frugoni.

79 Frostbite. (Contributo alla cura delle congelazioni; aria calda, demolizioni economiche, iniezioni antitetaniche ripetute.) L. Isnardi.

80 Eugenics and War. (L'eugenica e la guerra.) G. Dragotti.

February 27, No. 9, pp. 261-292

81 *Summary Diagnosis of Cholera. (A proposito della diagnosi batteriologica rapida del colera.) G. Castelli and L. Vigano.

82 Ligation of Lingual Artery to Arrest Secondary Hemorrhage From the Tongue. (Allacciatura dell'arteria linguale per emorragia secondaria della lingua.) L. Moncalvi.

February, Surgical Section No. 2, pp. 33-64

83 Gunshot Wounds of the Abdomen; Recovery in Severe Case. (Ferita d'arma da fuoco a pallini penetrante nell'addome con perforazione del colon ascendente ledente la loggia renale destra. —Laparatomia d'urgenza. Enterorrafia. Nefroscopia. Asportazione dei proiettili. Trattamento aperto. Guarigione.) O. Cignozzi. Commenced in No. 1.

84 *Application in the Clinic of Ambard's Formula for Estimation of Functional Capacity of the Kidneys. (Applicazioni cliniche della costante di Ambard.) V. Grossi.

85 The Functioning of the Omentum With Strangulated Hernia. (La funzione del grande epiploon negli strozzamenti erniari dell' intestino.) I. Scalone. To be continued.

78. **War Typhoid.**—Frugoni remarks that among the peculiarities of war typhoid are that the prodrome usually passes unperceived by the sick man or any one else. In his experience, the first signs of trouble were a high fever and symptoms of bronchitis or rheumatism, frequently misleading the physician to assume a simple febrile bronchitis or acute articular rheumatism. The pulse also behaves the reverse of what is usually observed in typhoid, the heart being already overfatigued to start with. The spleen is also liable to be already enlarged, in consequence of the antityphoid vaccination. He protests against special hospitals for typhoid patients, saying that any possible benefit from the specialist treatment is far outweighed by the injury from moving the sick man. He should be isolated where he is, and when this is the rule, war typhoid is no graver than under other conditions. The course was milder and briefer in the vaccinated, and in about a third of the cases the paratyphoid B bacillus seemed to be responsible, judging from the agglutination tests. Complications were frequent and severe, including fatal intestinal hemorrhage, phlebitis, cystitis, angiocholitis, suppurative otitis media, and polyneuritis.

81. **Bacteriologic Diagnosis of Cholera.**—Castelli and Vigano describe the technic with which they can examine a thousand specimens of stool a day and be ready to report in thirty hours.

84. **Ambard's Formula in Estimation of Functional Capacity of the Kidneys.**—Ambard's "uremic constant" has been described at various times in THE JOURNAL, as in the issue for March 7, 1914, p. 813. Grossi reviews the literature on the subject and his own findings with the application of numerical laws as governing the rate of excretion of urea and the proportional urea content of the blood. He ascertained the Ambard uremic index in 13 cases of renal tuberculosis; in 9 of other kidney diseases; in 8 of pyelonephritis from calculi; in 3 of kidney tumors; in 8 of disease of the bladder, and other kidney affections, to a total of over 51 cases in which the index was determined once or more times. His experience confirms the value of the index as an indication of the functioning of the kidneys as a whole. It is more reliable, he thinks, than colorimetric methods when catheterization of the ureters is impossible. Even at its best, however, he explains, the significance and the pathogenesis of the azotemia and the bases of the Ambard formula are still far from being thoroughly understood. In 2 cases of blood-borne infection of the kidney, with fatal outcome, the Ambard formula testified to almost normal conditions. The highest

index was in a case of renal tuberculosis, 2.7, and death soon ensued, as also in a case with index of 0.97. The index of 0.640 and 0.409 in a case of polycystic kidney indicates apparently that both kidneys are affected. He noticed that the index declined after a purge, suggesting that larger proportions of urea are eliminated in the stools under the influence of a purge.

Riforma Medica, Naples

January 10, XXXII, No. 2, pp. 29-56

86 Present Status of Early Diagnosis of Gastric Cancer. V. Patella. To be continued.
87 Bladder-Obturator Fistula From Stick in Girl's Bladder. D. Taddei.

January 17, No. 3, pp. 57-84

88 Gastric Cancer. V. Patella. To be continued.
89 The Dietary for the Insane From the Therapeutic Point of View. (Considerazione sul regime alimentare negli alienati.) A. Salerni.
90 Bipolar Electrode Electric Tests for Rendering Pain Objective. (La obbiettivazione del dolore al campo.) S. Ottolenghi.

Hospitalstidende, Copenhagen

February 23, LIX, No. 8, pp. 153-176

91 *Serodiagnosis From Spinal Fluid. (Undersøgelser over Weil-Kafka's Hæmolysinreaktion i Spinalvædsken, specielt ved sekundær Syfilis og Tabes dorsalis.) H. Boas and G. Neve.

91. Permeability of the Meninges in Syphilis.—Boas and Neve here report further research on the Weil-Kafka hemolysin reaction in the spinal fluid. Amboceptors against sheep corpuscles are found often in the blood but never normally in the cerebrospinal fluid. Discovery of hemolysis in the cerebrospinal fluid therefore indicates pathologic permeability on the part of the meninges, and this is evidently of frequent occurrence in syphilis. Hence, they declare, the Weil-Kafka test should be adopted as a routine procedure in diagnosis and control of syphilis. They obtained a positive hemolysin reaction in the spinal fluid in one of 9 patients with a primary lesion and positive Wassermann reaction; in 12 of 82 syphilitics in the secondary stage; in 2 of 10 in the tertiary stage; in 2 of 27 with latent syphilis, and in the one patient with inherited syphilis examined. In general paresis the reaction was positive in 73 per cent. of the 87 patients examined, and in 47 per cent. of the 34 tabetics. In 52 nonsyphilitic controls the test gave constantly negative findings except in 2 with a tumor in the brain and hemorrhagic fluid. In a number of the cases this Weil-Kafka reaction was the only one obtained and there never seemed to be any connection between it and the other reactions, the cell count, the globulin and the Wassermann reaction in the fluid and in the serum. When the reaction was estimated quantitatively, it seemed to be most intense in the paralytic dementia cases. The bibliography on the test is appended. [E. Weil and V. Kafka first called attention to it in the *Wiener klin. Wochenschrift*, 1911, xxiv, p. 335. Kafka's latest communication on it was reviewed in these columns, 1915, lxiv, p. 949. They add 1 c.c. of a thrice rinsed fresh 5 per cent. suspension of sheep blood to 10 c.c. of unheated cerebrospinal fluid, free from blood. The glass is set aside at 37 C. for an hour, and then the blood corpuscles are collected in a slowly revolving centrifuge. The supernatant fluid is decanted and the sediment is not rinsed. The sediment is then suspended in 1 c.c. saline and distributed in two test tubes. Then normal guinea-pig serum is added to each of the tubes, for the complement. The fact that the test is positive in acute meningitis does not detract from its differential value in syphilis, as there is no danger of confusion.]

Ugeskrift for Læger, Copenhagen

February 17, LXXVIII, No. 7, pp. 211-254

92 Extension of Field of Local Anesthesia. (Lokalanestesien i mere udvidet Anvendelse.) T. Iversen.
93 Artificial Limbs. (Om kunstige Lemmer.) E. Nyrop.

February 24, No. 8, pp. 255-286

94 Dietaries of 496 Families of Working Classes in Denmark. (Dyrtidskosten i Efteraaret 1915.) M. V. Bjørum and P. Heiberg.
95 *Syphilitic Heart Disease. (Mb. cordis syphiliticus.) C. Gram.

95. Syphilitic Heart Disease.—The first of Gram's two patients was a widow of 45 with pronounced heart disease presumably left by a severe attack of scarlet fever three years before. The degeneration of the myocardium apparently called for digitalis and the attacks of angina pectoris for nitroglycerin, etc. Gram was surprised to find no traces of peripheral arteriosclerosis, and he recalled that he had never known scarlet fever to entail angina pectoris. Myocarditis, endocarditis and pericarditis are common as relics of scarlet fever, but never angina pectoris. On this basis he instituted tentative treatment as for syphilis, and the prompt improvement confirmed the assumption that the trouble was some syphilitic affection of the coronary arteries although there had never been anything at any time to suggest syphilis. The Wassermann test was found positive. The second patient was about the same age and presented asystoly and attacks of tachycardia with subfebrile temperature but nothing resembling angina pectoris. As in such cases mercurial inunctions would be too betraying, he has for years always had good results with a tablespoonful three or four times a day of a mixture of 50 or 100 parts sodium iodid and 1 or 2 parts red mercuric iodid in distilled water to 3,000 parts.

Upsala Läkareförenings Förhandlingar

Nov. 26, 1915, XXI, No. 1-2, pp. 1-144. Last indexed Oct. 30, 1915, p. 159

96 True Hermaphroditism in Mammals and Man. (Om hermaphrodismus verus hos däggdjur och människa.) C. D. Josephson.
97 Pituitary Body in 123 Rabbits. (Bidrag till hypofysens åldersanatomi hos kaninen.) H. Björkman.
98 Expert Medical Testimony in Special Murder Case. (Mitt yttrande och medicinalstyrelsens utlåtande i det s. k. östmarksmålet.) A. Vestberg.

January 21, No. 3, pp. 145-217

99 The Secretion of Urine From the Chemical and Physiologic Standpoint. (Urinafsöndringen ur kemisk och fysiologisk synpunkt.) E. L. Backman.
100 *The Conception of Renal Diabetes Not Justified Clinically. (Finnes det någon renal diabetes i klinisk mening?) G. Bergmark.
101 Development of Motor Functioning During First Year of Life. (Studier öfver de motoriska funktionernas utveckling under första lefnadsåret.) G. Bergmark.

January 28, No. 4-5, pp. 219-398

102 Anatomy of the Thyroid in Rabbits. (Bidrag till sköldkörtelns åldersanatomi hos kaninen jämte några iakttagelser öfver den s. k. centralkanalen.) P. Häggström.
103 *Vomiting from Circulatory Disturbances. (Kräkningar som följd af cirkulationsrubbning.) G. Bergmark.

100. Renal Diabetes.—Bergmark thinks that the lack of an excess of sugar in the blood does not justify the assumption of renal diabetes as a clinical entity. He reports the particulars of a case which might come under the heading of renal diabetes, but then shows the fallacy of such an assumption, comparing the findings with those from a number of tests of the glucosuria in healthy persons. The patient in the case described was an unmarried woman of 34 with a small amount of sugar in the urine but none in the blood. The glucosuria was refractory to dietetic measures except that the sugar disappeared from the morning urine when she fasted. The blood sugar content was constantly normal. After ingestion of 100 gm. dextrose, there was hyperglycemia and it persisted abnormally long. He regards this as evidence against the assumption of renal diabetes. It testifies to some disturbance in the metabolism of sugar. He compares with this the cases of so-called renal diabetes that have been published, showing that only Gram's case can withstand criticism, and he is not certain as to special features of this.

103. Vomiting as Early Symptom of Heart Disease.—Bergmark had under observation for over a year a man of 74 who for eight years had had attacks of vomiting whenever he overexerted himself. He was always robust previously, but there was a history of excessive liquor drinking between 30 and 60. The vomiting seemed to be dependent on pathologic changes in the heart; necropsy revealed advanced coronary sclerosis while the stomach and intestines seemed normal. Various tests showed that under physical exertion the blood pressure ran up (from 140 to 220 on climbing stairs) and, as the blood pressure rose, the attack of vomiting came on while there was no tendency to vomit at other times. The detailed findings with three series of tests are tabulated, the whole apparently indicating that the vomiting attacks formed a kind of equivalent for angina pectoris.